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 <151> 2000-04-18  
 <150> JP 2000-117458  
 <151> 2000-04-19  
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&lt;212&gt; DNA

&lt;213&gt; Penicillium citrinum

&lt;400&gt; 15

ggaaggcaaa gaaagtgtac

20

&lt;210&gt; 16

&lt;211&gt; 21

&lt;212&gt; DNA

&lt;213&gt; Penicillium citrinum

&lt;400&gt; 16

agattcattg ctgttggcat c

21

&lt;210&gt; 17

&lt;211&gt; 722

&lt;212&gt; DNA

&lt;213&gt; Penicillium citrinum

&lt;400&gt; 17

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60

aactctgcga ttctgtttaa tcccaatcct atcgcccaaa aacaggatca gcagttatgg

120

atcaagccaa ctatccaaac gagccaattt tggttagtggg aagcgggtgt cggtttccag

180

gtgggtcaaa cacaccatca aaactttggg agctgctcaa agagccccgg gatgtacaga

240

ccaagatccc taaggagaga tttgacgtcg atacattttt cagccccgat ggcactcacc

300

ccgggcgcac gaacgcaccc tttgcatact tgctgcagga ggatctacgc ggttttgatg

360

cctctttttt caacatccaa gctggagagg ccgaaacgat tgacccacag caaaggctgc

420

tgctggagac ggtctatgaa gctgtatcca acgcaggcct acggatccaa ggccttcaag

480

gatcctctac tgctgtgtac gtcggatgtatga tgacgcattga ctatgagact atcgtgacgc

540

gtgaatttggaa tagtatttccat acataactctg ccacgggggt agctgtcagt gtggcctcca

600

accgtgtatc atacttcttc gactggcatg ggccgagtat gacgatcgac acagcctgtatc

660

gttcatcctt agctgccgtg catctggccg tccaaacagct tagaacgggc gagagtacca	720
tg	722

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 <213> *Penicillium citrinum*

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aaccgcaacc gcaaccgcaa ccgcaaccgc aaccgcaatg gcaggctcgg cttgctctaa	180
cacatccacg cccattgcca tagttggaaat gggatgtcga tttgctggag atgcaacgag	240
tccacagaag ctttggaaa tggttgaaag aggaggcagt gcctggctta aggtcccc	300
ctcgcgattc aatgtgagag gagtatacca cccgaatggc gaaagggtcg ggtccaccca	360
cgtaaagggt ggacacttca tcgacgagga tcctgctta tttgacgccg cgttttcaa	420
catgaccaca gaggtcgcca gctgcatgga tccgcagtat cggcttatgc ttgaggtgg	480
ctacgaatcg ctggagagtg ccggatcac catcgatggt atggcaggct ctaatacg	540
gtgtttggg ggtgtcatgt accacgacta tcaggattcg ctcaatcgat accccgagac	600
agttccgcgt tatttcataa ctggcaactc aggaacaatg ctttcgaacc ggatatcaca	660
cttctacgac ttacgtggtc ccagcgtgac ggttgcacacg gcctgttgcg cgacattgac	720
cgcactgcac ttggcgtgcc agagcttacg tactggggag	760

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 <211> 773  
 <212> DNA  
 <213> *Penicillium citrinum*

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cagcgctctc attcttcgtt ctttcttctt ttccactgggt gtgcatacggt cctatctgc	180
tcacgcaatg ctccggcagg ttcttcgtac cgtcgaatcg taccaatggg tatcgacccc	240
tcaaggccctt gtggcggtcg cagtgcattt tagtctcatc gcctaccgtt tgccggggcg	300
ccagtccgaa ctgcaagtct ataatccaa aaaatggtgg gagttgacga ccatgaggac	360
taggcaggac ttgcatacgat atggccgag ctggatcgaa gcttgggtt cggaaaaacga	420
caagccccctg cgcttcattt ttgattccgg ctattgcacc atcctccat cgtccatggc	480
cggcggatgtt cggaaaaatca aagatatgtg catgtacaag tttttggcgg atgactttca	540
cctctcatctc cctggattcg acgggttcaa ggaaatctgc caggatgcac atcttgcata	600
caaagttgtt ttgaaccagt tacaaaccca agcccccaag tacacaaagc cattggctac	660
cttggccgac gctactattt ccaagttgtt cggtaaaagc gaggagtgcc aaaccgcacc	720
tgtctattcc aatggattgg accttgcac acgaacagtc acactcatta tgg	773

<210> 20		
<211> 527		
<212> DNA		
<213> <i>Penicillium citrinum</i>		
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aaccgattag gttgctcatt cgattttgga gagactacct agctataaggt accactccaa	180	
gctgtacac agaccttca gcatggtcgc ttctgtgcta ccctctcgct ttccggtag	240	
ggaatcaatg aatcagcagc accctctacg ctggggaaat cgggcattga cttccacact	300	
ccaatttcta tccaaaacgg cgtgtctaca cccgatccat accgtttgca ccatacgat	360	
tctagctgtt accacatacg ttggactact caaagacagc ttcttccatg gccccgaaaa	420	
cgttgataaa gcagaatggg gctcttttgtt cgaaggaagt cgaagcttga tcaccggccc	480	
acagaatggc tggaagtggc agagcttgcg cggggatgca gatgttc	527	
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<211> 522		
<212> DNA		
<213> <i>Penicillium citrinum</i>		
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actatagaag cggccgcag tagagattca caccggccct tgaagcaaaa gtcggaaagga	180	
attgcgcgt gtcagaacct ctaccccta aagaaggaaa accaaggcca cagaaggaag	240	
aaagtcaaaa tgacacgctc gaagcgaatg agtccaagtc ccagcacatc acaggcctca	300	
agctcggtt ggtgggtgt tcagttactt tcgttagcatt ttgtatgccttctgatatgt	360	
ccattatcgt cacggcaatc ccacatatca caagcgagtt ccactctctg aacgatgttag	420	
gggtggtaggg cagtgtttat ttctggcata actgtgtctt ccagccccctg gccggtaaat	480	
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 <210> 22		
<211> 541		
<212> DNA		
<213> <i>Penicillium citrinum</i>		
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acgctcatgt gacgggtgtc atgcacaaaa gctcaaattgt accggtagca atgccaattt	180	
agtccgtgt cagtgtcaac gttgtcagca agccggatta aggtgtgtgt acagcgaaag	240	
gctacccaag cgcaatttac ataaagaagc cgcaatggaa actacaagag ccacagaaac	300	
ctcacaacccg atgaccgcga catctctac ggtcttctca tcattggcag agactcctcc	360	
accttactgc tcaccaccta cgcatattgg cacctcgca ctcaaggaaa cattatcaga	420	

accatcagcg gcaaccctgc aattctatga tacatcaatc aactttgatg atcccgagtc	480
gtttcccggc ggctggcctc agccaaatac atttcgcgac gatgccaaca gcaatgaatc	540
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<400> 23	
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<211> 20	
<212> DNA	
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<211> 20	
<212> DNA	
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<210> 27	
<211> 20	
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gtctttcct actatctacc	20
<210> 28	
<211> 20	
<212> DNA	
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<400> 28	
cttccccagc tgctactatc	20
<210> 29	
<211> 1524	
<212> DNA	
<213> <i>Penicillium citrinum</i>	
<400> 29	
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agtaattttg acaaagatac aagacgaatt cgctatttg agatgaatat gcgtgtgtca	120
attgaagccg aattcaggat agatttgcca tctgctctat tgccaaatttc taatccatct	180
ttatcatgaa caacactcaa accacacatc tgaattcacg gcgcgtgaacg atctaggcca	240
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cctgagcgtg ctcagggcca tacagcgagc tctgaagttt gacatgaatg agtgggtcct	360
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gaacactcgt cattttggca ttgccaattt agccactctc cgcttgaccc tgcttgtaat	480
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cctcacgcac actgtcctt gttggctacaa ggtgctcgcc gaatgtctt ctgcgcacga	660
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tccgctctt gattcggaaag gcgaccatgg gatctaaacg agcaattgtcttgcataactgtct	900
gccacgtgaa tggctgtatt tgctgctgtcttgc agcagggtca ttgatcagat	960
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cagagaattt ggtcgatggt cgctgcattt tcaccccgct gtaaatctgc ccgatctcat	1140
tgaacaggtt ttctgttgcgat ttcgggtact cttccctctgc ctccgcagcg ttgttgcaccc	1200
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cgctgctata gtcatcgcca gtaacaaagc acgtacggaa gatctcgatgc cggcgcaatg	1440
aggctttcag agccgcctc aaccgggtcga ggtcaatggt acccttcatg aacatgcca	1500
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<210> 30  
 <211> 784  
 <212> DNA  
 <213> *Penicillium citrinum*

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ataaaaatagt caggctcagc ccaggctcga ttccagattgg attcaggctt cagaccatgg	180
ccgctatgct cttctgtact atacctccgt cgagctatac ccgttggcc agacaaaagg	240
cttcactgaa cccttcaact taactgcatt tcgccccaaac taactcgacg aggccggcga	300
tggtagggccgat attcatgagc tcaaagatcg acacatcaac atggatttca gatgtgatcc	360
agtttcgaag ttcaatggcg acgagtgagt ctacgcccac acctgcccagg tttttggacg	420

aggacatgtc gtcttctgcc agaccaaaca ttgcgtatcg cttttccgtc attgcttga 480  
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ctggtcctt tttatgcgaa gagacaaagg attggctgc atgaaggact tggcggtatt 600  
taagtcccac aaaccgctgt tcctgtatcc agtttgcctc ggtccagtga gcacccgggg 660  
atgtgttgat tcctgttaacc acagctgcgg gaggtgatgg aaattgaggg gaagaacaca 720  
ggattgcctt ctccaaacaca tccatgacgt cctttcatg cataggcttg taacctattc 780  
tagc 784

<210> 31  
<211> 764  
<212> DNA  
<213> *Penicillium citrinum*

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attggaaataa gcctggggac ggatgcataat ttgttttagt ttgcgtgtta tatcttagca 180  
ccggtcatga gggagcggga tgtcctcggt ggcggcgt accatgagct ttgtggttgg 240  
atgcatacga acgctaaaag cgtgacggta gtatttgcata tcgtctcctg gtacaggctt 300  
cacatcatac tgaatcagta tatgagcgag gagaatcttgcatttccatcg aggcgaagaa 360  
ccgccccggga caagcgcgtg ggttccagcc gaagccgatg tgatcaccgt tggtattctc 420  
caattgagcg gtgaaggcct tgcgtggatc ctcgcgcattcgcataaaatc ggttagggatc 480  
ataattttcg gggttttccc acacatcagg gtgttcatg cggctctgcag ccacagcggc 540  
caactcgccc ttgggaatga agaggccatt ggatagagtg atgtctctga gagcggtaact 600  
gcgcatatgt ggcactcgatccggctgtatcgcgtc tctttcatgc agctgtcgag 660  
gagcttcagc ttgaacagag aggcaggcgt ccagccccct tctccgatc cagtgcggat 720  
ctcttggcgg agaggctgaa taaggctggatcgtgcctggca atgt 764

<210> 32  
<211> 765  
<212> DNA  
<213> *Penicillium citrinum*

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tgagataaccc tttctggccg ttcactctac cacctgcctg tctcattgca ttgtgcttt 180  
gaaaattatg acaataacaa ccaatgagaa aaaatatgat cctcctgcaa tgaatccact 240  
ggagggggta cggagcttgg aatgctccta agattccgac ctaatcagcg tcgagcccg 300  
tcagtagctg cagcactcgg cctcagtgca ttgttaggaa cagggactgt cctggttccg 360  
cctgacgggg agacacttcg agaaggggct gaagatgccc gggcagaacg gttgtgcgc 420  
atgtgcgcct tgaccaggtg accggccgct agggcagcac atagcgagag ctccccagcc 480

aaaacagcgc ttccgatgat	gcgcgcaagt	tgacgtgc	atctcaccggg	agtggtcggg	540		
tgtgatccgc	ggacaccaag	catgtcaagc	attgcgc	ccct ggggctccag	aatcgtacca	600	
ccgccccaa	cg ttccaac	ctc aatagacggc	atggagacag	agat	tttgaag	cgatccgcga	660
agattgttca	tgagagt	gatgc	ctctocacaa	cttgcgc	ccggg	atcctgac	720
gtggcaatga	aaatggctgc	cgcaagattg	gcagctt	ggg	cgttg		765

<210> 33  
 <211> 802  
 <212> DNA  
 <213> *Penicillium citrinum*

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aacgcggtca	agcatcagtc	tcaggcacag	cccggtgtc	gttttgg	ttt	gcaatctcc	180
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aagtatgatc	aacggcgaga	ctgttaagctt	ttacaacccc	tggaaagg	tttta	ttcttgctga	300
ccacatctct	gaagccagtc	gcccctgctg	ccgtcacggc	ctgcgtgtc	g	acagtggcg	360
catacttgct	caggccagtt	ctcaaaccgg	acc	aaag	tttgc	agtc	420
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agcccgat	aaattgg	tac	tttgc	atgtatgg	ggc	tttgc	600
ataccagacc	tgcgccat	tg	cgagaa	tttgc	ggcaaaat	atgt	660
atccctgtctt	tccaattgc	gagcc	ccat	aat	tttgc	tttgc	720
caggcaacat	gtacacacca	ctc	agtg	tttgc	tttgc	tttgc	780
tcggtagata	gttaggaaaag	ac					802

<210> 34  
 <211> 562  
 <212> DNA  
 <213> *Penicillium citrinum*

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tccctgag	gc	tttgc	tttgc	tttgc	tttgc	tttgc	180
ataggagacg	agg	ggc	ggc	ggc	ggc	ggc	240
tgcttggcat	atctgat	agg	act	agac	gaa	tagat	300
tcccaa	gt	ctca	atc	ccact	caata	gtc	360
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tagagtgaaa	ggc	gtc	gtc	gtc	gtc	gtc	480
accag	gtc	gtc	gtc	gtc	gtc	gtc	540
atccat	gt	gt	gt	gt	gt	gt	
tcgttgc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccatc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
accat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
tcgt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
ccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
acc	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
atccat	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	
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27

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96

cac atc aca ggc ctc aag ctc ggg ctg gtg gtt gct tca gtt act ttc  
 His Ile Thr Gly Leu Lys Leu Gly Leu Val Val Ala Ser Val Thr Phe  
 35 40 45

144

gta gca ttt ttg atg ctc ctt gat atg tcc att atc gtc acg gca atc  
 Val Ala Phe Leu Met Leu Leu Asp Met Ser Ile Ile Val Thr Ala Ile  
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192

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 Pro His Ile Thr Ser Glu Phe His Ser Leu Asn Asp Val Gly Trp Tyr  
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240

ggc agt gct tat ctt ctg gct aac tgt gct ctc cag ccc ctg gcc ggt  
 Gly Ser Ala Tyr Leu Leu Ala Asn Cys Ala Leu Gln Pro Leu Ala Gly  
 85 90 95

288

aaa ttg tat aca ctc ttg ggc ttg aag tac act ttc ttt gcc ttc ctc  
 Lys Leu Tyr Thr Leu Leu Gly Leu Lys Tyr Thr Phe Phe Ala Phe Leu  
 100 105 110

336

tgt att ttt gaa cta ggc tgg cta tgc ggt gcc gca aga tct tcc  
 Cys Ile Phe Glu Leu Gly Ser Val Leu Cys Gly Ala Ala Arg Ser Ser  
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384

acc atg ttg att gtt ggg cgg gcc gtt gct gga atg gga ggc tca ggt  
 Thr Met Leu Ile Val Gly Arg Ala Val Ala Gly Met Gly Gly Ser Gly  
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432

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480

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ccc cat aca tca act gtg aaa tgg gtc atg tac caa ttt atc gcg ggc Pro His Thr Ser Thr Val Lys Trp Val Met Tyr Gln Phe Ile Ala Gly 405 410 415				1248
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gga cag acg ttt gga gga tcg ctc ttc ctg gac ttt gct aac ctt gtc	1392
Gly Gln Thr Phe Gly Gly Ser Leu Phe Leu Asp Phe Ala Asn Leu Val	
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Phe Gly Ser Gly Leu Arg Thr Gly Leu Ser Lys Tyr Ala Pro Thr Val	
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Asp Thr Gln Ala Val Thr Ala Ala Gly Ala Thr Gly Phe Arg Asp Val	
485 490 495	
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Val Ser Lys Asn Asn Leu Pro Gly Val Val Lys Ala Tyr Ser Leu Ala	
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Val Asp His Thr Phe Tyr Leu Ala Val Gly Ala Thr Ala Cys Thr Phe	
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Val Phe Ala Phe Gly Met Gly Trp Arg Lys Ile Ala Thr Lys Asn Asp	
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Val Ala Phe Leu Met Leu Leu Asp Met Ser Ile Ile Val Thr Ala Ile	
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Pro His Ile Thr Ser Glu Phe His Ser Leu Asn Asp Val Gly Trp Tyr	
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Gly Ser Ala Tyr Leu Leu Ala Asn Cys Ala Leu Gln Pro Leu Ala Gly	
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Lys Leu Tyr Thr Leu Leu Gly Leu Lys Tyr Thr Phe Phe Ala Phe Leu	
100 105 110	
Cys Ile Phe Glu Leu Gly Ser Val Leu Cys Gly Ala Ala Arg Ser Ser	
115 120 125	

Thr Met Leu Ile Val Gly Arg Ala Val Ala Gly Met Gly Gly Ser Gly  
 130 135 140

Leu Val Asn Gly Ala Leu Thr Ile Leu Ser Thr Ala Ala Pro Lys His  
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Lys Gln Pro Val Leu Ile Gly Val Met Met Gly Leu Ser Gln Ile Ala  
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Ile Val Cys Gly Pro Leu Leu Gly Gly Ala Phe Thr Gln His Ala Thr  
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Trp Arg Trp Cys Phe Tyr Ile Asn Leu Pro Ile Gly Ala Val Ala Ala  
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Phe Leu Leu Leu Val Ile Thr Ile Pro Asp Arg Ile Ser Ser Thr Asp  
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Ser Glu Leu Ser Thr Asp Lys Pro Met Ala Asn Ile Lys Ser Thr Leu  
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Arg Lys Leu Asp Leu Val Gly Phe Val Val Phe Ala Ala Phe Ala Thr  
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Met Ile Ser Leu Ala Leu Glu Trp Gly Gly Ser Thr Tyr Thr Trp Arg  
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Ser Ser Val Ile Ile Gly Leu Phe Cys Gly Gly Phe Ala Leu Ile  
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Pro Gly Ser Val Ala Gly Lys Arg Gln Val Trp Cys Ser Cys Leu Phe  
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Met Gly Phe Phe Ser Gly Ser Leu Leu Val Phe Ser Tyr Tyr Leu Pro  
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Ile Tyr Phe Gln Ala Val Lys Asp Val Ser Pro Thr Leu Ser Gly Val  
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Tyr Met Leu Pro Gly Ile Leu Gly Gln Val Ile Met Ala Met Val Ser  
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Gly Phe Ala Ile Gly Lys Thr Gly Tyr Tyr Leu Pro Trp Ala Leu Gly  
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Ser Ala Val Leu Val Ala Ile Gly Ala Gly Leu Val Ser Thr Phe Gln  
 385 390 395 400

Pro His Thr Ser Thr Val Lys Trp Val Met Tyr Gln Phe Ile Ala Gly  
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Phe Gly Arg Gly Cys Gly Met Gln Thr Pro Ile Ile Ala Ile Gln Ser  
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Thr Leu Ser Pro Glu Gln Gly Ala Leu Gly Ile Ser Leu Ala Val Phe  
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Gly Gln Thr Phe Gly Gly Ser Leu Phe Leu Asp Phe Ala Asn Leu Val  
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Phe Gly Ser Gly Leu Arg Thr Gly Leu Ser Lys Tyr Ala Pro Thr Val  
 465 470 475 480

Asp Thr Gln Ala Val Thr Ala Ala Gly Ala Thr Gly Phe Arg Asp Val  
 485 490 495

Val Ser Lys Asn Asn Leu Pro Gly Val Val Lys Ala Tyr Ser Leu Ala  
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Val Asp His Thr Phe Tyr Leu Ala Val Gly Ala Thr Ala Cys Thr Phe  
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Thr Arg Ala Val Pro Glu Thr Asp Ala  
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Ala Gly Leu Arg Cys Val Tyr Ser Glu Arg Leu Pro Lys Arg Asn Leu  
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His Lys Glu Ala Ala Gly Thr Thr Arg Ala Thr Glu Thr Ser Gln  
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Pro Met Thr Ala Thr Ser Ser Thr Val Phe Ser Ser Leu Ala Glu Thr  
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Pro Pro Pro Tyr Cys Ser Pro Pro Thr His Ile Gly Thr Ser Ala Leu  
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Lys Glu Thr Leu Ser Glu Pro Ser Ala Ala Thr Leu Gln Phe Tyr Asp  
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Thr Ser Ile Asn Phe Asp Asp Pro Glu Ser Phe Pro Gly Gly Trp Pro  
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Gln Pro Asn Thr Phe Arg Asp Asp Ala Asn Ser Asn Glu Ser Ser Gly  
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Ile Pro Asp Leu Gly Tyr Asp Phe Glu Gly Pro Leu Asp Ala Thr Ala  
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Pro Val Ser Pro Ser Leu Phe Asp Leu Glu Val Glu Gly Asn Ser Ser  
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Ser Gly Gln Ser Asn Thr Ser Asn Thr Gln Arg Asp Leu Phe Glu Ser  
 195 200 205

Leu Ser Asp Val Ser Gln Asp Leu Glu Val Ile Leu His Gly Val Thr  
 210 215 220

Val Glu Trp Pro Lys Gln Lys Ile Leu Ser Tyr Pro Ile Gly Asp Phe  
 225 230 235 240

Leu Asn Ala Phe Gly Arg Leu Leu Leu His Leu Gln Glu Arg Val Ile  
 245 250 255

Thr Ser Ser Asn Ser Ser Met Leu Asp Gly Cys Leu Gln Thr Lys Asn  
 260 265 270

Leu Phe Met Ala Val His Cys Tyr Met Leu Ser Val Lys Ile Met Thr  
 275 280 285

Ser Leu Ser Gln Leu Leu Leu Ser Glu Val Met Lys Ala Gln Pro Cys  
 290 295 300

Gly Gln Lys Gln Ser Thr Arg Met Asp Trp Tyr Trp Ser Gly Ser Thr  
 305 310 315 320

Thr Arg Asn Asp Asn Gly Arg Ala Glu Ala Leu Pro Ser Phe His Ser  
 325 330 335

Asn Leu His Ile Gly Glu Leu Ile Ser His Leu Asp Pro Phe Met His  
 340 345 350

Ala Leu Ser Ser Ala Cys Thr Thr Leu Arg Val Ser Leu Arg Leu Leu  
 355 360 365

Ser Glu Ile Glu Thr Ala Leu Gly Ile Ala Gln Glu His Gly Ala Ala  
 370 375 380

Ala Ser Ile Arg Leu Val Leu Ser Asp Met Pro Ser Thr Ser Trp Gln  
 385 390 395 400

Ile Leu Gly Ala Glu Asn Lys Thr Ile Thr Pro Ala Ser Arg Leu Leu  
 405 410 415

Ser Val Leu Trp Ser Asp Glu Ala Gly Asp Glu Glu Pro Lys Ser Thr  
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Lys Ala Ser Gly Lys Thr Ile Asn Val Leu Arg Arg Cys Tyr Lys Glu  
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Ile Phe Ala Leu Ala Lys Lys His Asn Ile Ala  
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ggt tgt cgg ttt cca ggt ggt gtc aac aca cca tca aaa ctt tgg gag 96  
 Gly Cys Arg Phe Pro Gly Gly Val Asn Thr Pro Ser Lys Leu Trp Glu  
 20 25 30

ctg ctc aaa gag ccc cgg gat gta cag acc aag atc cct aag gag aga 144  
 Leu Leu Lys Glu Pro Arg Asp Val Gln Thr Lys Ile Pro Lys Glu Arg  
 35 40 45

ttt gac gtc gat aca ttt tac agc ccc gat ggc act cac ccc ggg cgc 192  
 Phe Asp Val Asp Thr Phe Tyr Ser Pro Asp Gly Thr His Pro Gly Arg  
 50 55 60

acg aac gca ccc ttt gca tac ttg ctg cag gag gat cta cgc ggt ttt 240  
 Thr Asn Ala Pro Phe Ala Tyr Leu Leu Gln Glu Asp Leu Arg Gly Phe  
 65 70 75 80

gat gcc tct ttc ttc aac atc caa gct gga gag gcc gaa acg att gac 288  
 Asp Ala Ser Phe Phe Asn Ile Gln Ala Gly Glu Ala Glu Thr Ile Asp  
 85 90 95

cca cag caa agg ctg ctg gag acg gtc tat gaa gct gta tcc aac 336  
 Pro Gln Gln Arg Leu Leu Leu Glu Thr Val Tyr Glu Ala Val Ser Asn  
 100 105 110

gca ggc cta cgg atc caa ggc ctt caa gga tcc tct act gct gtg tac 384  
 Ala Gly Leu Arg Ile Gln Gly Leu Gln Gly Ser Ser Thr Ala Val Tyr  
 115 120 125

gtc ggt atg atg acg cat gac tat gag act atc gtg acg cgt gaa ttg Val Gly Met Met Thr His Asp Tyr Glu Thr Ile Val Thr Arg Glu Leu 130 135 140	432
gat agt att cct aca tac tct gcc acg ggg gta gct gtc agt gtg gcc Asp Ser Ile Pro Thr Tyr Ser Ala Thr Gly Val Ala Val Ser Val Ala 145 150 155 160	480
tcc aac cgt gta tca tac ttc ttc gac tgg cat ggg ccg agt atg acg Ser Asn Arg Val Ser Tyr Phe Phe Asp Trp His Gly Pro Ser Met Thr 165 170 175	528
atc gac aca gcc tgt agt tca tcc tta gct gcc gtg cat ctg gcc gtc Ile Asp Thr Ala Cys Ser Ser Leu Ala Ala Val His Leu Ala Val 180 185 190	576
caa cag ctt aga acg ggc gag agt acc atg gcg gtt gca gcc ggt gcg Gln Gln Leu Arg Thr Gly Glu Ser Thr Met Ala Val Ala Ala Gly Ala 195 200 205	624
aat ctg ata ttg ggc ccc atg acc ttt gta atg gag agc aaa ttg aac Asn Leu Ile Leu Gly Pro Met Thr Phe Val Met Glu Ser Lys Leu Asn 210 215 220	672
atg ctg tcc ccc aat ggt aga tct cga atg tgg gat gct gct gcc gat Met Leu Ser Pro Asn Gly Arg Ser Arg Met Trp Asp Ala Ala Ala Asp 225 230 235 240	720
gga tat gcc aga gga gaa ggt gtt tgc tct att gtc ctg aaa acg ctg Gly Tyr Ala Arg Gly Glu Gly Val Cys Ser Ile Val Leu Lys Thr Leu 245 250 255	768
agc cag gca ctg cgc gac ggg gac agt atc gag tgt gtt atc cga gag Ser Gln Ala Leu Arg Asp Gly Asp Ser Ile Glu Cys Val Ile Arg Glu 260 265 270	816
acc ggt atc aac caa gat ggc cga acg aca ggt atc aca atg cca aac Thr Gly Ile Asn Gln Asp Gly Arg Thr Thr Gly Ile Thr Met Pro Asn 275 280 285	864
cat agc gca caa gaa gcc ctc att cgg gcc aca tat gcc aag gct ggt His Ser Ala Gln Glu Ala Leu Ile Arg Ala Thr Tyr Ala Lys Ala Gly 290 295 300	912
ctt gat att acc aac ccc cag gaa cgc tgc cag ttc ttt gaa gcc cat Leu Asp Ile Thr Asn Pro Gln Glu Arg Cys Gln Phe Phe Glu Ala His 305 310 315 320	960
gga act ggt aca cca gcc ggt gac cca cag gaa gct gag gct att gca Gly Thr Gly Thr Pro Ala Gly Asp Pro Gln Glu Ala Glu Ala Ile Ala 325 330 335	1008
aca gcc ttc ttc gga cac aag gat gga aca atc gac agc gac ggc gag Thr Ala Phe Phe Gly His Lys Asp Gly Thr Ile Asp Ser Asp Gly Glu 340 345 350	1056
aaa gat gag ctt ttt gtc ggc agc atc aag aca gtt ctc ggt cac acg Lys Asp Glu Leu Phe Val Gly Ser Ile Lys Thr Val Leu Gly His Thr 355 360 365	1104
gaa ggc act gct ggt att gcg ggc tta atg aag gca tcg ttt gct gta Glu Gly Thr Ala Gly Ile Ala Gly Leu Met Lys Ala Ser Phe Ala Val 370 375 380	1152
cga aat ggc gtg atc ccg cca aac ctg ctg ttt gag aag atc agt ccc Arg Asn Gly Val Ile Pro Pro Asn Leu Leu Phe Glu Lys Ile Ser Pro 385 390 395 400	1200
cgt gtc gct ccg ttc tat acg cac ttg aaa att gca acg gag gcc aca Arg Val Ala Pro Phe Tyr Thr His Leu Lys Ile Ala Thr Glu Ala Thr	1248

405

410

415

gaa tgg ccg att gtt gcg ccc ggg cag cct cgc aga gtc agc gtt aat Glu Trp Pro Ile Val Ala Pro Gly Gln Pro Arg Arg Val Ser Val Asn 420	425	430	1296
tca ttt gga ttt ggt ggt aca aat gcc cat gct att atc gaa gag tat Ser Phe Gly Phe Gly Gly Thr Asn Ala His Ala Ile Ile Glu Glu Tyr 435	440	445	1344
atg gct cct cca cac aag ccg aca gca gtg gta aca gag gtg acc tca Met Ala Pro Pro His Lys Pro Thr Ala Val Val Thr Glu Val Thr Ser 450	455	460	1392
gat gca gat gca tgc agc ttg ccc ctt gtg ctt tca tcg aag tcg cag Asp Ala Asp Ala Cys Ser Leu Pro Leu Val Leu Ser Ser Lys Ser Gln 465	470	475	1440
cgc tcc atg aag gca acg cta gaa aat atg ctc caa ttt ctg gaa acg Arg Ser Met Lys Ala Thr Leu Glu Asn Met Leu Gln Phe Leu Glu Thr 485	490	495	1488
cat gat gac gtg gac atg cat gat atc gca tat acc tta ctt gag aaa His Asp Asp Val Asp Met His Asp Ile Ala Tyr Thr Leu Leu Glu Lys 500	505	510	1536
cgg tct atc ttg ccc ttc cgt cgt gcg att gca gca cac aac aag gaa Arg Ser Ile Leu Pro Phe Arg Arg Ala Ile Ala Ala His Asn Lys Glu 515	520	525	1584
gta gcc cgc gcg gca ctg gag gct gcc atc gcg gac ggt gag gtc gtc Val Ala Arg Ala Leu Glu Ala Ala Ile Ala Asp Gly Glu Val Val 530	535	540	1632
acc gac ttc cgc acc gac gcg aat gac aac cct cgc gta cta ggt gtc Thr Asp Phe Arg Thr Asp Ala Asn Asp Asn Pro Arg Val Leu Gly Val 545	550	555	1680
ttt act ggc caa ggt gca cag tgg ccg ggc atg ctg aag aag ctc atg Phe Thr Gly Gln Gly Ala Gln Trp Pro Gly Met Leu Lys Lys Leu Met 565	570	575	1728
gtg ggt atg cca ttt gtg aga ggc att ctc gaa gag ctg gat aat tca Val Gly Met Pro Phe Val Arg Gly Ile Leu Glu Leu Asp Asn Ser 580	585	590	1776
ctg caa aca ctg cct gaa aag tat cgg cct acg tgg aca ctg tat gac Leu Gln Thr Leu Pro Glu Lys Tyr Arg Pro Thr Trp Thr Leu Tyr Asp 595	600	605	1824
cag ctc atg ctt gaa ggg gat gcc tca aac gtc aga ctc gcc agc ttc Gln Leu Met Leu Glu Gly Asp Ala Ser Asn Val Arg Leu Ala Ser Phe 610	615	620	1872
tcc cag cct cta tgc tgc gcc gta caa atc gtt ctg gtc cga ctt ctc Ser Gln Pro Leu Cys Cys Ala Val Gln Ile Val Leu Val Arg Leu Leu 625	630	635	1920
gct gca gct ggt atc gag ttc agt gca att gtc ggc cac agt tca ggt Ala Ala Ala Gly Ile Glu Phe Ser Ala Ile Val Gly His Ser Ser Gly 645	650	655	1968
gag att gcc tgt gcc ttt gcg gca gga ttc atc agt gcc act caa gct Glu Ile Ala Cys Ala Phe Ala Ala Gly Phe Ile Ser Ala Thr Gln Ala 660	665	670	2016
atc cgt att gcg cat ctg cgt gga gtt gtg tcc gcg gag cat gcc tct Ile Arg Ile Ala His Leu Arg Gly Val Val Ser Ala Glu His Ala Ser 675	680	685	2064

tct cca agc ggc cag aca ggc gct atg cta gcg gca ggt atg tcg tac Ser Pro Ser Gly Gln Thr Gly Ala Met Leu Ala Ala Gly Met Ser Tyr 690 695 700	2112
gat gac gca aag gaa cta tgc gag ctc gaa gcc ttt gag ggt cgg gtc Asp Asp Ala Lys Glu Leu Cys Glu Leu Glu Ala Phe Glu Gly Arg Val 705 710 715 720	2160
tgc gtc gcc gct agc aat tca ccg gat agt gtg acc ttc tcc ggc gac Cys Val Ala Ala Ser Asn Ser Pro Asp Ser Val Thr Phe Ser Gly Asp 725 730 735	2208
atg gat gct atc cag cac gtt gaa ggt gtc ttg gag gat gaa tcc act Met Asp Ala Ile Gln His Val Glu Gly Val Leu Glu Asp Glu Ser Thr 740 745 750	2256
ttt gcc aga atc ttg aga gtt gac aag gcc tac cat tcg cat cac atg Phe Ala Arg Ile Leu Arg Val Asp Lys Ala Tyr His Ser His His Met 755 760 765	2304
cac cca tgc gca gct cca tat gtc aag gca ttg ctg gag tgc gac tgt His Pro Cys Ala Ala Pro Tyr Val Lys Ala Leu Leu Glu Cys Asp Cys 770 775 780	2352
gct gtt gcc gat ggc caa ggt aac gat agt gtt gct tgg ttc tct gcc Ala Val Ala Asp Gly Gln Gly Asn Asp Ser Val Ala Trp Phe Ser Ala 785 790 795 800	2400
gtc cac gag acc agc aag caa atg act gta cag gat gtg atg ccc gct Val His Glu Thr Ser Lys Gln Met Thr Val Gln Asp Val Met Pro Ala 805 810 815	2448
tat tgg aaa gac aat ctc gtc tct ccg gtc ttg ttc tcg cag gct gtg Tyr Trp Lys Asp Asn Leu Val Ser Pro Val Leu Phe Ser Gln Ala Val 820 825 830	2496
cag aaa gca gtc atc act cat cgt cta atc gac gtc gcc atc gaa att Gln Lys Ala Val Ile Thr His Arg Leu Ile Asp Val Ala Ile Glu Ile 835 840 845	2544
ggc gcc cac cct ctc aag ggt ccg tgt cta gcc acc atc aag gat Gly Ala His Pro Ala Leu Lys Gly Pro Cys Leu Ala Thr Ile Lys Asp 850 855 860	2592
gct ctt gcc ggt gtg gag ctg ccg tat acc ggg tgc ttg gca cga aac Ala Leu Ala Gly Val Glu Leu Pro Tyr Thr Gly Cys Leu Ala Arg Asn 865 870 875 880	2640
gtt gac gat gtg gac gct ttt gct gga ggt ctg gga tac att tgg gag Val Asp Asp Val Asp Ala Phe Ala Gly Gly Leu Gly Tyr Ile Trp Glu 885 890 895	2688
cgt ttc gga gtt cgg agt atc gac gcc gag ggc ttc gta caa caa gtc Arg Phe Gly Val Arg Ser Ile Asp Ala Glu Gly Phe Val Gln Gln Val 900 905 910	2736
cgg ccc gat cgt gcc gtt caa aac ctg tca aag tca ttg ccc aca tac Arg Pro Asp Arg Ala Val Gln Asn Leu Ser Lys Ser Leu Pro Thr Tyr 915 920 925	2784
tct tgg gat cat act cgt caa tac tgg gca gaa tct cgc tcc acc cgc Ser Trp Asp His Thr Arg Gln Tyr Trp Ala Glu Ser Arg Ser Thr Arg 930 935 940	2832
cag cat ctt cgt ggaa ggt gcg ccc cat ctt ctg ctt gga aag ctt tct Gln His Leu Arg Gly Gly Ala Pro His Leu Leu Gly Lys Leu Ser 945 950 955 960	2880
tct tac agc aca gca tcg acc ttc cag tgg aca aac ttc atc agg ccc Ser Tyr Ser Thr Ala Ser Thr Phe Gln Trp Thr Asn Phe Ile Arg Pro	2928

965

970

975

cgg gat ctg gaa tgg ctc gac ggt cat gcg cta caa ggc cag act gtg			2976
Arg Asp Leu Glu Trp Leu Asp Gly His Ala Leu Gln Gly Gln Thr Val			
980	985	990	
ttc ccc gct gct ggg tac ata att atg gcc atg gaa gct gcc atg aag			3024
Phe Pro Ala Ala Gly Tyr Ile Ile Met Ala Met Glu Ala Ala Met Lys			
995	1000	1005	
gtg gct ggt gag cgt gcc gcc caa gtt cag ctc ctg gaa atc ttg			3069
Val Ala Gly Glu Arg Ala Ala Gln Val Gln Leu Leu Glu Ile Leu			
1010	1015	1020	
gac atg agc atc aac aaa gcc atc gtg ttt gaa gat gaa aac acc			3114
Asp Met Ser Ile Asn Lys Ala Ile Val Phe Glu Asp Glu Asn Thr			
1025	1030	1035	
tcc gtg gag ctg aac ttg aca gcc gaa gtc acc agt gac aat gat			3159
Ser Val Glu Leu Asn Leu Thr Ala Glu Val Thr Ser Asp Asn Asp			
1040	1045	1050	
gcg gat ggc caa gtc acg gtc aaa ttt gtt att gat tcc tgc ctg			3204
Ala Asp Gly Gln Val Thr Val Lys Phe Val Ile Asp Ser Cys Leu			
1055	1060	1065	
gca aag gag agt gag ctt tcg aca tcc gcc aaa ggc caa atc gtc			3249
Ala Lys Glu Ser Glu Leu Ser Thr Ser Ala Lys Gly Gln Ile Val			
1070	1075	1080	
ata acc ctt ggc gag gca tca ccg tca tcg cag ctt ttg ccg cca			3294
Ile Thr Leu Gly Glu Ala Ser Pro Ser Ser Gln Leu Leu Pro Pro			
1085	1090	1095	
cct gag gaa gag tac ccc cag atg aac aat gtc aac atc gat ttc			3339
Pro Glu Glu Glu Tyr Pro Gln Met Asn Asn Val Asn Ile Asp Phe			
1100	1105	1110	
ttc tat cgg gaa ctt gac ctc ctt ggg tat gac tac agc aaa gac			3384
Phe Tyr Arg Glu Leu Asp Leu Leu Gly Tyr Asp Tyr Ser Lys Asp			
1115	1120	1125	
ttc cgt cgt ttg cag acc atg aga agg gcc gac tcc aaa gct agc			3429
Phe Arg Arg Leu Gln Thr Met Arg Arg Ala Asp Ser Lys Ala Ser			
1130	1135	1140	
ggc acc ttg gct ttc ctt cca ctt aag gat gaa ttg cgc aat gag			3474
Gly Thr Leu Ala Phe Leu Pro Leu Lys Asp Glu Leu Arg Asn Glu			
1145	1150	1155	
ccc ctc ttg ctc cac cca gcg ccc ctg gac atc gcg ttc cag act			3519
Pro Leu Leu Leu His Pro Ala Pro Leu Asp Ile Ala Phe Gln Thr			
1160	1165	1170	
gtc att gga gcg tat tcc tct cca gga gat cgt cgc cta cgc tca			3564
Val Ile Gly Ala Tyr Ser Ser Pro Gly Asp Arg Arg Leu Arg Ser			
1175	1180	1185	
ttg tac gtg cct act cac gtt gac aga gtg act ctg att cca tcg			3609
Leu Tyr Val Pro Thr His Val Asp Arg Val Thr Leu Ile Pro Ser			
1190	1195	1200	
ctc tgt ata tcg gcg ggt aat tct ggt gaa acc gag ctt gcg ttt			3654
Leu Cys Ile Ser Ala Gly Asn Ser Gly Glu Thr Glu Leu Ala Phe			
1205	1210	1215	
gac aca atc aac aca cac gac aag ggt gat ttc ctg agc ggc gac			3699
Asp Thr Ile Asn Thr His Asp Lys Gly Asp Phe Leu Ser Gly Asp			
1220	1225	1230	

atc acg	gtg tac gat tcg acc	aag aca acg ctt ttc	caa gtt gat	3744
Ile Thr	Val Tyr Asp Ser Thr	Lys Thr Thr Leu Phe	Gln Val Asp	
1235	1240	1245		
aac att	gtc ttt aag cct ttc	tct ccc ccc act gct	tcg acc gac	3789
Asn Ile	Val Phe Lys Pro Phe	Ser Pro Pro Thr Ala	Ser Thr Asp	
1250	1255	1260		
cac cga	atc ttc gca aag tgg	gtc tgg gga ccc ctc	acg ccc gaa	3834
His Arg	Ile Phe Ala Lys Trp	Val Trp Gly Pro Leu	Thr Pro Glu	
1265	1270	1275		
aaa ctg	ctg gag gac cct gcg	acg ttg atc ata gct	cgg gac aag	3879
Lys Leu	Leu Glu Asp Pro Ala	Thr Leu Ile Ala	Arg Asp Lys	
1280	1285	1290		
gag gac	att ctg acc atc gag	cga atc gtt tac ttc	tac atc aaa	3924
Glu Asp	Ile Leu Thr Ile Glu	Arg Ile Val Tyr Phe	Tyr Ile Lys	
1295	1300	1305		
tcc ttc	cta gcc cag ata acc	ccc gac gac cgt caa	aat gcc gac	3969
Ser Phe	Leu Ala Gln Ile Thr	Pro Asp Asp Arg Gln	Asn Ala Asp	
1310	1315	1320		
ctc cat	tcc cag aag tac att	gaa tgg tgt gac cag	gtt cag gcc	4014
Leu His	Ser Gln Lys Tyr Ile	Glu Trp Cys Asp Gln	Val Gln Ala	
1325	1330	1335		
gat gct	cgg gct ggc cac cat	cag tgg tac cag gag	tct tgg gag	4059
Asp Ala	Arg Ala Gly His His	Gln Trp Tyr Gln Glu	Ser Trp Glu	
1340	1345	1350		
gag gac	act tct gtt cac att	gag caa atg tgt gaa	agc aac tcg	4104
Glu Asp	Thr Ser Val His Ile	Glu Gln Met Cys Glu	Ser Asn Ser	
1355	1360	1365		
tcc cac	cca cat gtg cgc ctg	atc caa agg gta ggc	aaa gaa tta	4149
Ser His	Pro His Val Arg Leu	Ile Gln Arg Val Gly	Lys Glu Leu	
1370	1375	1380		
att tca	att gtt cgc ggg aac	ggg gat cct ttg gat	atc atg aac	4194
Ile Ser	Ile Val Arg Gly Asn	Gly Asp Pro Leu Asp	Ile Met Asn	
1385	1390	1395		
cgc gat	ggg ttg ttc acc gag	tac tat acc aac aag	ctc gcc ttt	4239
Arg Asp	Gly Leu Phe Thr Glu	Tyr Tyr Thr Asn Lys	Leu Ala Phe	
1400	1405	1410		
ggc tca	gca ata cac gtc gtt	cag gat ctg gtt agc	caa att gct	4284
Gly Ser	Ala Ile His Val Val	Gln Asp Leu Val Ser	Gln Ile Ala	
1415	1420	1425		
cat cgc	tac caa tcc att gat	atc ctt gag atc ggc	ttg ggt aca	4329
His Arg	Tyr Gln Ser Ile Asp	Ile Leu Glu Ile Gly	Leu Gly Thr	
1430	1435	1440		
ggc atc	gcc acg aag cgc gtt	ctt gca tca cct caa	ctt ggt ttc	4374
Gly Ile	Ala Thr Lys Arg Val	Leu Ala Ser Pro Gln	Leu Gly Phe	
1445	1450	1455		
aac agt	tac act tgc act gac	atc tcg gcg gat gtt	att ggc aag	4419
Asn Ser	Tyr Thr Cys Thr Asp	Ile Ser Ala Asp Val	Ile Gly Lys	
1460	1465	1470		
gcc cgt	gaa caa ctt tcc gaa	ttc gac ggt ctc atg	cag ttt gag	4464
Ala Arg	Glu Gln Leu Ser Glu	Phe Asp Gly Leu Met	Gln Phe Glu	
1475	1480	1485		
gca cta	gac atc aac aga agc	cca gca gag caa gga	ttc aag cct	4509
Ala Leu	Asp Ile Asn Arg Ser	Pro Ala Glu Gln Gly	Phe Lys Pro	

1490	1495	1500	
cac tcc tac gat ctg att att	gca tcc gat gtc ctc	cat gcc agc	4554
His Ser Tyr Asp Leu Ile Ile	Ala Ser Asp Val Leu	His Ala Ser	
1505	1510	1515	
tcc aac ttc gag gaa aaa ttg	gct cac ata agg tcc	ttg ctc aag	4599
Ser Asn Phe Glu Glu Lys Leu	Ala His Ile Arg Ser	Leu Leu Lys	
1520	1525	1530	
ccg ggt ggt cac ttg gtt act	ttc ggg gtc acc cat	cgc gag cct	4644
Pro Gly Gly His Leu Val Thr	Phe Gly Val Thr His	Arg Glu Pro	
1535	1540	1545	
gct cgc ctc gcc ttc atc tct	ggg ctt ttc gct gat	cga tgg act	4689
Ala Arg Leu Ala Phe Ile Ser	Gly Leu Phe Ala Asp	Arg Trp Thr	
1550	1555	1560	
gga gaa gac gaa act cgt gct	ttg agt gcc tcg ggg	tcc gtt gac	4734
Gly Glu Asp Glu Thr Arg Ala	Leu Ser Ala Ser Gly	Ser Val Asp	
1565	1570	1575	
caa tgg gag cat acc ctc aag	aga gtt ggg ttc tct	ggc gtc gat	4779
Gln Trp Glu His Thr Leu Lys	Arg Val Gly Phe Ser	Gly Val Asp	
1580	1585	1590	
agt cgg aca ctt gat cga gag	gat gat ttg atc ccg	tct gtc ttc	4824
Ser Arg Thr Leu Asp Arg Glu	Asp Asp Leu Ile Pro	Ser Val Phe	
1595	1600	1605	
agt aca cat gct gtg gat gcc	acc gtt gag cgt ttg	tat gat cca	4869
Ser Thr His Ala Val Asp Ala	Thr Val Glu Arg Leu	Tyr Asp Pro	
1610	1615	1620	
ctt tct gct cca ttg aag gac	tca tac ccg cca tta	gtg gtt atc	4914
Leu Ser Ala Pro Leu Lys Asp	Ser Tyr Pro Pro Leu	Val Val Ile	
1625	1630	1635	
ggt ggc gaa tcg aca aaa acc	gaa cgc att ttg aac	gac atg aaa	4959
Gly Gly Glu Ser Thr Lys Thr	Glu Arg Ile Leu Asn	Asp Met Lys	
1640	1645	1650	
gct gcc cta ccg cat aga cac	atc cac tcc gtc aag	cgg ctg gaa	5004
Ala Ala Leu Pro His Arg His	Ile His Ser Val Lys	Arg Leu Glu	
1655	1660	1665	
agt gtt ctc gac gac ccg gcc	ttg cag cct aag tcg	act ttt gtc	5049
Ser Val Leu Asp Asp Pro Ala	Leu Gln Pro Lys Ser	Thr Phe Val	
1670	1675	1680	
atc ctc tcg gaa ctt gat gat	gaa gtg ttt tgc aac	ctt gaa gag	5094
Ile Leu Ser Glu Leu Asp Asp	Glu Val Phe Cys Asn	Leu Glu Glu	
1685	1690	1695	
gac aag ttt gag gca gtc aag	tct ctt ctc ttc tac	gcc gga cgc	5139
Asp Lys Phe Glu Ala Val Lys	Ser Leu Leu Phe Tyr	Ala Gly Arg	
1700	1705	1710	
atg atg tgg ctg aca gag aat	gcc tgg att gat cat	ccc cac cag	5184
Met Met Trp Leu Thr Glu Asn	Ala Trp Ile Asp His	Pro His Gln	
1715	1720	1725	
gcc agc acc atc gga atg ttg	agg aca atc aag ctc	gag aac cct	5229
Ala Ser Thr Ile Gly Met Leu	Arg Thr Ile Lys Leu	Glu Asn Pro	
1730	1735	1740	
gac ttg gga acg cac gtc ttc	gat gtc gat act gtg	gag aac cta	5274
Asp Leu Gly Thr His Val Phe	Asp Val Asp Thr Val	Glu Asn Leu	
1745	1750	1755	

gac acc	aaa ttc ttc gtt gag	caa ctt ttg cgc ttc	gag gag agc	5319
Asp Thr	Lys Phe Phe Val Glu	Gln Leu Leu Arg Phe	Glu Glu Ser	
1760	1765	1770		
gat gat	cag ctt ttg gaa tca	ata aca tgg act cat	gag ccc gaa	5364
Asp Asp	Gln Leu Leu Glu Ser	Ile Thr Trp Thr His	Glu Pro Glu	
1775	1780	1785		
gtg tac	tgg tgc aag ggt cgt	gcc tgg gtc cct cgt	ttg aag cag	5409
Val Tyr	Trp Cys Lys Gly Arg	Ala Trp Val Pro Arg	Leu Lys Gln	
1790	1795	1800		
gat att	gct agg aac gac cgt	atg aac tca tct cgt	cgt cca att	5454
Asp Ile	Ala Arg Asn Asp Arg	Met Asn Ser Ser Arg	Arg Pro Ile	
1805	1810	1815		
tcc ggt	aac ttt aat tcg tcc	aag acg gcc att gca	ctg aaa gag	5499
Phe Gly	Asn Phe Asn Ser Ser	Lys Thr Ala Ile Ala	Leu Lys Glu	
1820	1825	1830		
gcg agg	gga gca tcc tca tcg	atg tac tat ctt gag	tca acc gag	5544
Ala Arg	Gly Ala Ser Ser Ser	Met Tyr Tyr Leu Glu	Ser Thr Glu	
1835	1840	1845		
acg tgt	gat tcg tta gaa gac	gct cgt cat gct gga	aaa gca act	5589
Thr Cys	Asp Ser Leu Glu Asp	Ala Arg His Ala Gly	Lys Ala Thr	
1850	1855	1860		
gtt cgt	gtt cgc tac gct ctt	ccc cag gca att cgc	gtg ggc cat	5634
Val Arg	Val Arg Tyr Ala Leu	Pro Gln Ala Ile Arg	Val Gly His	
1865	1870	1875		
ctc gga	tac ttc cat gtc gtg	cag ggc agt att ctg	gag aat aca	5679
Leu Gly	Tyr Phe His Val Val	Gln Gly Ser Ile Leu	Glut Asn Thr	
1880	1885	1890		
tgt gag	gtg cct gta gtc gcc	ctg gct gag aag aat	gga tct ata	5724
Cys Glu	Val Pro Val Val Ala	Leu Ala Glu Lys Asn	Gly Ser Ile	
1895	1900	1905		
ctg cat	gta ccg aga aac tac	atg cat agt ctg ccc	gat aac atg	5769
Leu His	Val Pro Arg Asn Tyr	Met His Ser Leu Pro	Asp Asn Met	
1910	1915	1920		
gcg gaa	ggc gag gat agt tcc	ttc ttg tcc aca	gct gca gcc	5814
Ala Glu	Gly Glu Asp Ser Ser	Phe Leu Leu Ser Thr	Ala Ala Ala	
1925	1930	1935		
ctc ctt	gcc gaa aca att ctc	tct agc gct cag tcc	ttt ggc tct	5859
Leu Leu	Ala Glu Thr Ile Leu	Ser Ser Ala Gln Ser	Phe Gly Ser	
1940	1945	1950		
gat gca	tca att ctg att atg	gag ccc cca atc ttc	tgc gtc aaa	5904
Asp Ala	Ser Ile Leu Ile Met	Glu Pro Pro Ile Phe	Cys Val Lys	
1955	1960	1965		
gca att	ctg gag tcg gcc aaa	acc tac ggt gtt cag	gtt cat ttg	5949
Ala Ile	Leu Glu Ser Ala Lys	Thr Tyr Gly Val Gln	Val His Leu	
1970	1975	1980		
gca aca	act ctg tcc gac gtc	aaa act att ccg gct	cct tgg atc	5994
Ala Thr	Thr Leu Ser Asp Val	Lys Thr Ile Pro Ala	Pro Trp Ile	
1985	1990	1995		
cga tta	cat gcc aag gaa acc	gac gct cgg ctg aaa	cac agc ctg	6039
Arg Leu	His Ala Lys Glu Thr	Asp Ala Arg Leu Lys	His Ser Leu	
2000	2005	2010		
ccg aca	aac atg atg gca ttc	ttt gac ttg tct acc	gac cgg act	6084
Pro Thr	Asn Met Met Ala Phe	Phe Asp Leu Ser Thr	Asp Arg Thr	

2015	2020	2025	
gct gcc ggg ata acc aac cgt Ala Ala Gly Ile Thr Asn Arg 2030	ttg gcc aag ttg cta cca ccc agt Leu Ala Lys Leu Leu Pro Pro Ser 2035	2040	6129
tgc ttc atg tac agt ggt gac Cys Phe Met Tyr Ser Gly Asp 2045	tat ctt atc cga agt aca gct tcc Tyr Leu Ile Arg Ser Thr Ala Ser 2050	2055	6174
aca tac aaa gtt agt cat gtt Thr Tyr Lys Val Ser His Val 2060	gag gat att cca atc ctc gag cac Glu Asp Ile Pro Ile Leu Glu His 2065	2070	6219
tct gtg gca atg gca aaa aat Ser Val Ala Met Ala Lys Asn 2075	acc gtc tct gcg tcg act gtc gac Thr Val Ser Ala Ser Thr Val Asp 2080	2085	6264
gac act gag aaa gtt att aca Asp Thr Glu Lys Val Ile Thr 2090	gcc aca caa att ctc ttg cct ggt Ala Thr Gln Ile Leu Leu Pro Gly 2095	2100	6309
cag ctc tct gtc aac cac aat Gln Leu Ser Val Asn His Asn 2105	gac caa cgc ttc aat ctg gcc acc Asp Gln Arg Phe Asn Leu Ala Thr 2110	2115	6354
gtc atc gac tgg aag gaa aat Val Ile Asp Trp Lys Glu Asn 2120	gag gtg tcc gct agg att tgc ccc Glu Val Ser Ala Arg Ile Cys Pro 2125	2130	6399
atc gac tct ggt aac tta ttt Ile Asp Ser Gly Asn Leu Phe 2135	tcc aac aag aag acg tat ttg ctt Ser Asn Lys Lys Thr Tyr Leu Leu 2140	2145	6444
gtt ggt ctt acc ggg gac ctt Val Gly Leu Thr Gly Asp Leu 2150	ggt cgc tct ctc tgt cgc tgg atg Gly Arg Ser Leu Cys Arg Trp Met 2155	2160	6489
atc ttg cat ggc gcc cgc cat Ile Leu His Gly Ala Arg His 2165	gtt gtg ctc act agc cgg aac cct Val Val Leu Thr Ser Arg Asn Pro 2170	2175	6534
cga ctt gat ccc aaa tgg atc Arg Leu Asp Pro Lys Trp Ile 2180	gcc aac atg gag gca ctt ggt ggt Ala Asn Met Glu Ala Leu Gly Gly 2185	2190	6579
gac atc acc gtt ctg tca atg Asp Ile Thr Val Leu Ser Met 2195	gat gtt gcc aat gag gat tca gtc Asp Val Ala Asn Glu Asp Ser Val 2200	2205	6624
gat gct ggc ctt ggc aag ctt Asp Ala Gly Leu Gly Lys Leu 2210	gtc gat atg aag ttg cca cct gtt Val Asp Met Lys Leu Pro Pro Val 2215	2220	6669
gcc ggc atc gcg ttc ggg cct Ala Gly Ile Ala Phe Gly Pro 2225	ttg gtg ctg cag gat gtc atg ctg Leu Val Leu Gln Asp Val Met Leu 2230	2235	6714
aag aac atg gac cac cag atg Lys Asn Met Asp His Gln Met 2240	atg gac atg gtg ttg aag ccc aag Met Asp Met Val Leu Lys Pro Lys 2245	2250	6759
gta caa gga gca cgc att ctt Val Gln Gly Ala Arg Ile Leu 2255	cat gaa cgg ttc tcc gaa cag acg His Glu Arg Phe Ser Glu Gln Thr 2260	2265	6804
ggc agc aag gcg ctc gac ttc Gly Ser Lys Ala Leu Asp Phe 2270	ttc atc atg ttt tcg tcc att gtt Phe Ile Met Phe Ser Ser Ile Val 2275	2280	6849

gca gtt	att ggc aat cct ggc	cag tcc aac tat ggc	gct gcg aat	6894
Ala Val	Ile Gly Asn Pro Gly	Gln Ser Asn Tyr Gly	Ala Ala Asn	
2285	2290	2295		
gcc tac	cta cag gct ctg gcc	cag caa cgg tgc gcc	aga gga ttg	6939
Ala Tyr	Leu Gln Ala Leu Ala	Gln Gln Arg Cys Ala	Arg Gly Leu	
2300	2305	2310		
gcg gga	tca acc atc gat att	ggt gcc gtt tac ggt	gta ggg ttt	6984
Ala Gly	Ser Thr Ile Asp Ile	Gly Ala Val Tyr Gly	Val Gly Phe	
2315	2320	2325		
gtc acg	agg gcc gag atg gag	gag gac ttt gat gct	atc cgt ttc	7029
Val Thr	Arg Ala Glu Met Glu	Glu Asp Phe Asp Ala	Ile Arg Phe	
2330	2335	2340		
atg ttt	gac tca gtt gaa gag	cat gag ctg cac acg	ctt ttc gcc	7074
Met Phe	Asp Ser Val Glu Glu	His Glu Leu His Thr	Leu Phe Ala	
2345	2350	2355		
gaa gcg	gtc gtg tct gac cag	cgt gcc cgg cag caa	cca cag cgc	7119
Glu Ala	Val Val Ser Asp Gln	Arg Ala Arg Gln Gln	Pro Gln Arg	
2360	2365	2370		
aag acg	gtc att gac atg gcg	gac ctt gag ctt acc	acg ggt atc	7164
Lys Thr	Val Ile Asp Met Ala	Asp Leu Glu Leu Thr	Thr Gly Ile	
2375	2380	2385		
cca gat	ctt gac cct gcg ctt	caa gat cga att att	tac ttc aac	7209
Pro Asp	Leu Asp Pro Ala Leu	Gln Asp Arg Ile Ile	Tyr Phe Asn	
2390	2395	2400		
gac cct	cgt ttc gga aac ttc	aaa att ccc ggt caa	cgc gga gac	7254
Asp Pro	Arg Phe Gly Asn Phe	Lys Ile Pro Gly Gln	Arg Gly Asp	
2405	2410	2415		
ggt ggc	gac aat gga tca ggg	tct aaa ggc tcc att	gcc gac cag	7299
Gly Gly	Asp Asn Gly Ser Gly	Ser Lys Gly Ser Ile	Ala Asp Gln	
2420	2425	2430		
ctc aaa	caa gca aca act tta	gac caa gtt cgg caa	atc gtg att	7344
Leu Lys	Gln Ala Thr Thr Leu	Asp Gln Val Arg Gln	Ile Val Ile	
2435	2440	2445		
gat ggt	cta tct gag aaa ctc	cgt gtt acc ctc caa	gtt tcg gac	7389
Asp Gly	Leu Ser Glu Lys Leu	Arg Val Thr Leu Gln	Val Ser Asp	
2450	2455	2460		
ggg gag	agc gtg gac cca acc	att cct ctc att gat	caa ggt gtc	7434
Gly Glu	Ser Val Asp Pro Thr	Ile Pro Leu Ile Asp	Gln Gly Val	
2465	2470	2475		
gac tcc	ttg ggt gca gtg act	gtc ggc tca tgg ttc	tca aag caa	7479
Asp Ser	Leu Gly Ala Val Thr	Val Gly Ser Trp Phe	Ser Lys Gln	
2480	2485	2490		
ctc tac	ctt gac ctc cca ctc	ttg agg gta ctt ggc	ggt gct tct	7524
Leu Tyr	Leu Asp Leu Pro Leu	Leu Arg Val Leu Gly	Gly Ala Ser	
2495	2500	2505		
gtc gct	gat ctt gcc gac gac	gcg gcc acc cga ctc	cca gct aca	7569
Val Ala	Asp Leu Ala Asp Asp	Ala Ala Thr Arg Leu	Pro Ala Thr	
2510	2515	2520		
tcc att	ccg ctg ctg ttg caa	att ggt gat tcc acg	gga acc tcg	7614
Ser Ile	Pro Leu Leu Leu Gln	Ile Gly Asp Ser Thr	Gly Thr Ser	
2525	2530	2535		
gac agc	ggg gct tct ccg aca	cca aca gac agc cat	gat gaa gca	7659
Asp Ser	Gly Ala Ser Pro Thr	Pro Thr Asp Ser His	Asp Glu Ala	

2540	2545	2550	
agc tct gct acc agc aca gat Ser Ser Ala Thr Ser Thr Asp	2555 2560	gcg tcg tca gcc gaa Ala Ser Ser Ala Glu	gag gat gaa Glu Asp Glu
gag caa gag gac gat aat gag Glu Gln Glu Asp Asp Asn	2570 2575	cag gga ggc cgt aag Gln Gly Gly Arg Lys	att ctt cgt Ile Leu Arg
cgc gag agg ttg tcc ctt ggc Arg Glu Arg Leu Ser Leu Gly	2585 2590	cag gag tat tcc tgg Gln Glu Tyr Ser Trp	agg cag caa Arg Gln Gln
caa atg gta aaa gat cat acc Gln Met Val Lys Asp His	2600	atc ttc aac aac act Thr Ile Phe Asn Asn Thr	att ggc atg Ile Gly Met
tcc atg aag ggt acc att gac Phe Met Lys Gly Thr Ile Asp	2615	ctc gac cgg ttg agg Leu Asp Arg Leu Arg	cgg gct ctg Arg Ala Leu
aaa gcc tca ttg cgc cgt cac Lys Ala Ser Leu Arg Arg	2630	gag atc ttc cgt acg Glu Ile Phe Arg Thr	tgc ttt gtt Cys Phe Val
act ggc gat gac tat agc agc Thr Gly Asp Asp Tyr Ser	2645	gat tta aat ggt ccc Asp Leu Asn Gly Pro	gtc caa gtg Val Gln Val
gtt ctc aag aac ccg gag aac Val Leu Lys Asn Pro Glu Asn	2660	aga gtg cac ttt gtt Arg Val His Phe Val	cag gtg aac Gln Val Asn
aac gct gcg gag gca gag gaa Asn Ala Ala Glu Ala Glu	2675	gag tac cgg aaa ctc Glu Tyr Arg Lys Leu	gag aag aca Glu Lys Thr
aac tat agc atc tcc aca ggt Asn Tyr Ser Ile Ser Thr Gly	2690	gac act ctc aga ctc Asp Thr Leu Arg Leu	gtt gat ttc Val Asp Phe
tac tgg ggc aca gat gac cac Tyr Trp Gly Thr Asp Asp His	2705	ctg ttg gta atc ggc Leu Leu Val Ile Gly	tac cac aga Tyr His Arg
tta gtt ggt gat ggc tca aca Leu Val Gly Asp Gly Ser Thr	2720	aca gaa aac ctg ttc Thr Glu Asn Leu Phe	aat gag atc Asn Glu Ile
ggg cag att tac agc ggg gtg Gly Gln Ile Tyr Ser Gly Val	2735	aaa atg cag cga cca Lys Met Gln Arg Pro	tcg acc caa Ser Thr Gln
ttc tct gat cta gcc gtc caa Phe Ser Asp Leu Ala Val Gln	2750	cag cgg gaa aac ctg Gln Arg Glu Asn Leu	gaa aat ggg Glu Asn Gly
cga atg ggg gac gat atc gcg Arg Met Gly Asp Asp Ile Ala	2765	ttc tgg aag tcc atg Phe Trp Lys Ser Met	cat agc aaa His Ser Lys
gtc tcg tca tct gcg cca acc Val Ser Ser Ser Ala Pro Thr	2780	gtg ctt ccc atc atg Val Leu Pro Ile Met	aat ctg atc Asn Leu Ile
aat gac cct gct gcc aat tca Asn Asp Pro Ala Ala Asn Ser	2795	gag cag cag caa ata Glu Gln Gln Ile	cag cca ttc Gln Pro Phe
	2800		2805

acg tgg cag cag tat gaa gca	att gct cgt tta gat	ccc atg gtc	8469
Thr Trp Gln Gln Tyr Glu Ala	Ile Ala Arg Leu Asp	Pro Met Val	
2810	2815	2820	
gcc ttc cga atc aaa gag cg	agc cgc aag cac aag	gca acc ccc	8514
Ala Phe Arg Ile Lys Glu Arg	Ser Arg Lys His Lys	Ala Thr Pro	
2825	2830	2835	
atg cag ttc tac ctg gcc	tac cac gtt ttg ttg	gcg cgt ctt	8559
Met Gln Phe Tyr Leu Ala	Ala Tyr His Val Leu Leu	Ala Arg Leu	
2840	2845	2850	
acc ggc agc aaa gac ata acc	atc ggc ctc gcc gaa	acc aac cga	8604
Thr Gly Ser Lys Asp Ile	Thr Ile Gly Leu Ala Glu	Thr Asn Arg	
2855	2860	2865	
tcc acc atg gaa gaa att tcg	gcg atg ggc ttt ttc	gct aac gtg	8649
Ser Thr Met Glu Glu Ile	5er Ala Met Gly Phe Phe	Ala Asn Val	
2870	2875	2880	
ctt ccc ctg cgc ttt gat gag	ttc gtc ggc agc aag	aca ttc ggc	8694
Leu Pro Leu Arg Phe Asp	Glu Phe Val Gly Ser Lys	Thr Phe Gly	
2885	2890	2895	
gag cac ctt gta gcc acc aag	gac agt gtg cgt gag	gcc atg caa	8739
Glu His Leu Val Ala Thr	Lys Asp Ser Val Arg Glu	Ala Met Gln	
2900	2905	2910	
cac gcg cggt ccg tat ggc	gtc atc ctc gac tgt	cta ggc ctg	8784
His Ala Arg Val Pro Tyr	Gly Val Ile Leu Asp Cys	Leu Gly Leu	
2915	2920	2925	
aat ctc cct acc tca ggc gag	gaa ccc aag act cag	aca cac gcc	8829
Asn Leu Pro Thr Ser Gly	Glu Pro Lys Thr Gln	Thr His Ala	
2930	2935	2940	
ccc ttg ttc cag gct gtc ttt	gat tac aag cag ggt	caa gcg gag	8874
Pro Leu Phe Gln Ala Val	Phe Asp Tyr Lys Gln Gly	Gln Ala Glu	
2945	2950	2955	
agt ggc tca att ggc aat gcc	aaa atg acg agt gtt	ctc gct tcc	8919
Ser Gly Ser Ile Gly Asn Ala	Lys Met Thr 5er Val	Leu Ala Ser	
2960	2965	2970	
cgt gag cgc act cct tat gac	atc gtt ctc gag atg	tgg gat gac	8964
Arg Glu Arg Thr Pro Tyr Asp	Ile Val Leu Glu Met	Trp Asp Asp	
2975	2980	2985	
cct acc aag gac cca ctc att	cat gtc aaa ctt cag	agc tcg ctg	9009
Pro Thr Lys Asp Pro Leu Ile	His Val Lys Leu Gln	5er Ser Leu	
2990	2995	3000	
tat ggc cct gag cac gct cag	gcc ttt gta gac cac	ttt tct tca	9054
Tyr Gly Pro Glu His Ala Gln	Ala Phe Val Asp His	Phe Ser Ser	
3005	3010	3015	
atc ctc act atg ttc tcg atg	aac ccg gct ctg aag	ttg gcc tag	9099
Ile Leu Thr Met Phe Ser Met	Asn Pro Ala Leu Lys	Leu Ala	
3020	3025	3030	

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 <211> 3032  
 <212> PRT  
 <213> Penicillium citrinum

<400> 44

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Gly Cys Arg Phe Pro Gly Val Asn Thr Pro Ser Lys Leu Trp Glu  
 20 25 30

Leu Leu Lys Glu Pro Arg Asp Val Gln Thr Lys Ile Pro Lys Glu Arg  
 35 40 45

Phe Asp Val Asp Thr Phe Tyr Ser Pro Asp Gly Thr His Pro Gly Arg  
 50 55 60

Thr Asn Ala Pro Phe Ala Tyr Leu Leu Gln Glu Asp Leu Arg Gly Phe  
 65 70 75 80

Asp Ala Ser Phe Phe Asn Ile Gln Ala Gly Glu Ala Glu Thr Ile Asp  
 85 90 95

Pro Gln Gln Arg Leu Leu Leu Glu Thr Val Tyr Glu Ala Val Ser Asn  
 100 105 110

Ala Gly Leu Arg Ile Gln Gly Leu Gln Gly Ser Ser Thr Ala Val Tyr  
 115 120 125

Val Gly Met Met Thr His Asp Tyr Glu Thr Ile Val Thr Arg Glu Leu  
 130 135 140

Asp Ser Ile Pro Thr Tyr Ser Ala Thr Gly Val Ala Val Ser Val Ala  
 145 150 155 160

Ser Asn Arg Val Ser Tyr Phe Phe Asp Trp His Gly Pro Ser Met Thr  
 165 170 175

Ile Asp Thr Ala Cys Ser Ser Ser Leu Ala Ala Val His Leu Ala Val  
 180 185 190

Gln Gln Leu Arg Thr Gly Glu Ser Thr Met Ala Val Ala Ala Gly Ala  
 195 200 205

Asn Leu Ile Leu Gly Pro Met Thr Phe Val Met Glu Ser Lys Leu Asn  
 210 215 220

Met Leu Ser Pro Asn Gly Arg Ser Arg Met Trp Asp Ala Ala Ala Asp  
 225 230 235 240

Gly Tyr Ala Arg Gly Glu Gly Val Cys Ser Ile Val Leu Lys Thr Leu  
 245 250 255

Ser Gln Ala Leu Arg Asp Gly Asp Ser Ile Glu Cys Val Ile Arg Glu  
 260 265 270

Thr Gly Ile Asn Gln Asp Gly Arg Thr Thr Gly Ile Thr Met Pro Asn  
 275 280 285

His Ser Ala Gln Glu Ala Leu Ile Arg Ala Thr Tyr Ala Lys Ala Gly  
 290 295 300

Leu Asp Ile Thr Asn Pro Gln Glu Arg Cys Gln Phe Phe Glu Ala His  
 305 310 315 320

Gly Thr Gly Thr Pro Ala Gly Asp Pro Gln Glu Ala Glu Ala Ile Ala  
 325 330 335

Thr Ala Phe Phe Gly His Lys Asp Gly Thr Ile Asp Ser Asp Gly Glu  
 340 345 350

Lys Asp Glu Leu Phe Val Gly Ser Ile Lys Thr Val Leu Gly His Thr  
 355 360 365

Glu Gly Thr Ala Gly Ile Ala Gly Leu Met Lys Ala Ser Phe Ala Val  
 370 375 380

Arg Asn Gly Val Ile Pro Pro Asn Leu Leu Phe Glu Lys Ile Ser Pro  
 385 390 395 400

Arg Val Ala Pro Phe Tyr Thr His Leu Lys Ile Ala Thr Glu Ala Thr  
 405 410 415

Glu Trp Pro Ile Val Ala Pro Gly Gln Pro Arg Arg Val Ser Val Asn  
 420 425 430

Ser Phe Gly Phe Gly Gly Thr Asn Ala His Ala Ile Ile Glu Glu Tyr  
 435 440 445

Met Ala Pro Pro His Lys Pro Thr Ala Val Val Thr Glu Val Thr Ser  
 450 455 460

Asp Ala Asp Ala Cys Ser Leu Pro Leu Val Leu Ser Ser Lys Ser Gln  
 465 470 475 480

Arg Ser Met Lys Ala Thr Leu Glu Asn Met Leu Gln Phe Leu Glu Thr  
 485 490 495

His Asp Asp Val Asp Met His Asp Ile Ala Tyr Thr Leu Leu Glu Lys  
 500 505 510

Arg Ser Ile Leu Pro Phe Arg Arg Ala Ile Ala Ala His Asn Lys Glu  
 515 520 525

Val Ala Arg Ala Ala Leu Glu Ala Ala Ile Ala Asp Gly Glu Val Val  
 530 535 540

Thr Asp Phe Arg Thr Asp Ala Asn Asp Asn Pro Arg Val Leu Gly Val  
 545 550 555 560

Phe Thr Gly Gln Gly Ala Gln Trp Pro Gly Met Leu Lys Lys Leu Met  
 565 570 575

Val Gly Met Pro Phe Val Arg Gly Ile Leu Glu Glu Leu Asp Asn Ser  
 580 585 590

Leu Gln Thr Leu Pro Glu Lys Tyr Arg Pro Thr Trp Thr Leu Tyr Asp  
 595 600 605

Gln Leu Met Leu Glu Gly Asp Ala Ser Asn Val Arg Leu Ala Ser Phe  
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Ser Gln Pro Leu Cys Cys Ala Val Gln Ile Val Leu Val Arg Leu Leu  
 625 630 635 640

Ala Ala Ala Gly Ile Glu Phe Ser Ala Ile Val Gly His Ser Ser Gly  
 645 650 655

Glu Ile Ala Cys Ala Phe Ala Ala Gly Phe Ile Ser Ala Thr Gln Ala  
 660 665 670

Ile Arg Ile Ala His Leu Arg Gly Val Val Ser Ala Glu His Ala Ser  
 675 680 685

Ser Pro Ser Gly Gln Thr Gly Ala Met Leu Ala Ala Gly Met Ser Tyr  
 690 695 700

Asp Asp Ala Lys Glu Leu Cys Glu Leu Glu Ala Phe Glu Gly Arg Val  
 705 710 715 720

Cys Val Ala Ala Ser Asn Ser Pro Asp Ser Val Thr Phe Ser Gly Asp  
 725 730 735

Met Asp Ala Ile Gln His Val Glu Gly Val Leu Glu Asp Glu Ser Thr  
 740 745 750

Phe Ala Arg Ile Leu Arg Val Asp Lys Ala Tyr His Ser His His Met  
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His Pro Cys Ala Ala Pro Tyr Val Lys Ala Leu Leu Glu Cys Asp Cys  
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Val His Glu Thr Ser Lys Gln Met Thr Val Gln Asp Val Met Pro Ala  
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Tyr Trp Lys Asp Asn Leu Val Ser Pro Val Leu Phe Ser Gln Ala Val  
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Gln Lys Ala Val Ile Thr His Arg Leu Ile Asp Val Ala Ile Glu Ile  
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Gly Ala His Pro Ala Leu Lys Gly Pro Cys Leu Ala Thr Ile Lys Asp  
 850 855 860

Ala Leu Ala Gly Val Glu Leu Pro Tyr Thr Gly Cys Leu Ala Arg Asn  
 865 870 875 880

Val Asp Asp Val Asp Ala Phe Ala Gly Gly Leu Gly Tyr Ile Trp Glu  
 885 890 895

Arg Phe Gly Val Arg Ser Ile Asp Ala Glu Gly Phe Val Gln Gln Val  
 900 905 910

Arg Pro Asp Arg Ala Val Gln Asn Leu Ser Lys Ser Leu Pro Thr Tyr  
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Ser Trp Asp His Thr Arg Gln Tyr Trp Ala Glu Ser Arg Ser Thr Arg  
 930 935 940

Gln His Leu Arg Gly Gly Ala Pro His Leu Leu Gly Lys Leu Ser  
 945 950 955 960

Ser Tyr Ser Thr Ala Ser Thr Phe Gln Trp Thr Asn Phe Ile Arg Pro  
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Arg Asp Leu Glu Trp Leu Asp Gly His Ala Leu Gln Gly Gln Thr Val  
 980 985 990

Phe Pro Ala Ala Gly Tyr Ile Ile Met Ala Met Glu Ala Ala Met Lys  
 995 1000 1005

Val Ala Gly Glu Arg Ala Ala Gln Val Gln Leu Leu Glu Ile Leu  
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Asp Met Ser Ile Asn Lys Ala Ile Val Phe Glu Asp Glu Asn Thr  
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Ser Val Glu Leu Asn Leu Thr Ala Glu Val Thr Ser Asp Asn Asp  
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Ala Lys Glu Ser Glu Leu Ser Thr Ser Ala Lys Gly Gln Ile Val  
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Ile Thr Leu Gly Glu Ala Ser Pro Ser Ser Gln Leu Leu Pro Pro  
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Pro Glu Glu Glu Tyr Pro Gln Met Asn Asn Val Asn Ile Asp Phe  
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Phe Tyr Arg Glu Leu Asp Leu Leu Gly Tyr Asp Tyr Ser Lys Asp  
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Gly Thr Leu Ala Phe Leu Pro Leu Lys Asp Glu Leu Arg Asn Glu  
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Pro Leu Leu Leu His Pro Ala Pro Leu Asp Ile Ala Phe Gln Thr  
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Val Ile Gly Ala Tyr Ser Ser Pro Gly Asp Arg Arg Leu Arg Ser  
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Leu Tyr Val Pro Thr His Val Asp Arg Val Thr Leu Ile Pro Ser  
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Leu Cys Ile Ser Ala Gly Asn Ser Gly Glu Thr Glu Leu Ala Phe  
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Asp Thr Ile Asn Thr His Asp Lys Gly Asp Phe Leu Ser Gly Asp  
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Ile Thr Val Tyr Asp Ser Thr Lys Thr Thr Leu Phe Gln Val Asp  
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Asn Ile Val Phe Lys Pro Phe Ser Pro Pro Thr Ala Ser Thr Asp  
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His Arg Ile Phe Ala Lys Trp Val Trp Gly Pro Leu Thr Pro Glu  
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Lys Leu Leu Glu Asp Pro Ala Thr Leu Ile Ile Ala Arg Asp Lys  
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Glu Asp Ile Leu Thr Ile Glu Arg Ile Val Tyr Phe Tyr Ile Lys  
 1295 1300 1305

Ser Phe Leu Ala Gln Ile Thr Pro Asp Asp Arg Gln Asn Ala Asp  
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Leu His Ser Gln Lys Tyr Ile Glu Trp Cys Asp Gln Val Gln Ala  
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Glu Asp Thr Ser Val His Ile Glu Gln Met Cys Glu Ser Asn Ser  
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Ser His Pro His Val Arg Leu Ile Gln Arg Val Gly Lys Glu Leu  
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Ile Ser Ile Val Arg Gly Asn Gly Asp Pro Leu Asp Ile Met Asn  
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Gly Ser Ala Ile His Val Val Gln Asp Leu Val Ser Gln Ile Ala  
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His Arg Tyr Gln Ser Ile Asp Ile Leu Glu Ile Gly Leu Gly Thr  
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Gly Ile Ala Thr Lys Arg Val Leu Ala Ser Pro Gln Leu Gly Phe  
 1445 1450 1455

Asn Ser Tyr Thr Cys Thr Asp Ile Ser Ala Asp Val Ile Gly Lys  
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Ala Arg Glu Gln Leu Ser Glu Phe Asp Gly Leu Met Gln Phe Glu  
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Ala Leu Asp Ile Asn Arg Ser Pro Ala Glu Gln Gly Phe Lys Pro  
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His Ser Tyr Asp Leu Ile Ile Ala Ser Asp Val Leu His Ala Ser  
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Ser Asn Phe Glu Glu Lys Leu Ala His Ile Arg Ser Leu Leu Lys  
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Pro Gly Gly His Leu Val Thr Phe Gly Val Thr His Arg Glu Pro  
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Ala Arg Leu Ala Phe Ile Ser Gly Leu Phe Ala Asp Arg Trp Thr  
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Gly Glu Asp Glu Thr Arg Ala Leu Ser Ala Ser Gly Ser Val Asp  
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Gln Trp Glu His Thr Leu Lys Arg Val Gly Phe Ser Gly Val Asp  
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Ser Arg Thr Leu Asp Arg Glu Asp Asp Leu Ile Pro Ser Val Phe  
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Ser Thr His Ala Val Asp Ala Thr Val Glu Arg Leu Tyr Asp Pro  
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Leu Ser Ala Pro Leu Lys Asp Ser Tyr Pro Pro Leu Val Val Ile  
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Gly Gly Glu Ser Thr Lys Thr Glu Arg Ile Leu Asn Asp Met Lys  
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Ala Ala Leu Pro His Arg His Ile His Ser Val Lys Arg Leu Glu  
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Ser Val Leu Asp Asp Pro Ala Leu Gln Pro Lys Ser Thr Phe Val  
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Ile Leu Ser Glu Leu Asp Asp Glu Val Phe Cys Asn Leu Glu Glu  
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Asp Lys Phe Glu Ala Val Lys Ser Leu Leu Phe Tyr Ala Gly Arg  
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Met Met Trp Leu Thr Glu Asn Ala Trp Ile Asp His Pro His Gln  
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Ala Ser Thr Ile Gly Met Leu Arg Thr Ile Lys Leu Glu Asn Pro  
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Asp Leu Gly Thr His Val Phe Asp Val Asp Thr Val Glu Asn Leu  
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Asp Thr Lys Phe Phe Val Glu Gln Leu Leu Arg Phe Glu Glu Ser  
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Asp Asp Gln Leu Leu Glu Ser Ile Thr Trp Thr His Glu Pro Glu  
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Val Tyr Trp Cys Lys Gly Arg Ala Trp Val Pro Arg Leu Lys Gln  
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Phe Gly Asn Phe Asn Ser Ser Lys Thr Ala Ile Ala Leu Lys Glu  
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Val Arg Val Arg Tyr Ala Leu Pro Gln Ala Ile Arg Val Gly His  
 1865 1870 1875

Leu Gly Tyr Phe His Val Val Gln Gly Ser Ile Leu Glu Asn Thr  
 1880 1885 1890

Cys Glu Val Pro Val Val Ala Leu Ala Glu Lys Asn Gly Ser Ile  
 1895 1900 1905

Leu His Val Pro Arg Asn Tyr Met His Ser Leu Pro Asp Asn Met  
 1910 1915 1920

Ala Glu Gly Glu Asp Ser Ser Phe Leu Leu Ser Thr Ala Ala Ala  
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Leu Leu Ala Glu Thr Ile Leu Ser Ser Ala Gln Ser Phe Gly Ser  
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Asp Ala Ser Ile Leu Ile Met Glu Pro Pro Ile Phe Cys Val Lys  
 1955 1960 1965

Ala Ile Leu Glu Ser Ala Lys Thr Tyr Gly Val Gln Val His Leu  
 1970 1975 1980

Ala Thr Thr Leu Ser Asp Val Lys Thr Ile Pro Ala Pro Trp Ile  
 1985 1990 1995

Arg Leu His Ala Lys Glu Thr Asp Ala Arg Leu Lys His Ser Leu  
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Pro Thr Asn Met Met Ala Phe Phe Asp Leu Ser Thr Asp Arg Thr  
 2015 2020 2025

Ala Ala Gly Ile Thr Asn Arg Leu Ala Lys Leu Leu Pro Pro Ser  
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Cys Phe Met Tyr Ser Gly Asp Tyr Leu Ile Arg Ser Thr Ala Ser  
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Thr Tyr Lys Val Ser His Val Glu Asp Ile Pro Ile Leu Glu His  
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Ser Val Ala Met Ala Lys Asn Thr Val Ser Ala Ser Thr Val Asp  
 2075 2080 2085

Asp Thr Glu Lys Val Ile Thr Ala Thr Gln Ile Leu Leu Pro Gly  
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Gln Leu Ser Val Asn His Asn Asp Gln Arg Phe Asn Leu Ala Thr  
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Val Ile Asp Trp Lys Glu Asn Glu Val Ser Ala Arg Ile Cys Pro  
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Ile Asp Ser Gly Asn Leu Phe Ser Asn Lys Lys Thr Tyr Leu Leu  
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Val Gly Leu Thr Gly Asp Leu Gly Arg Ser Leu Cys Arg Trp Met  
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Ile Leu His Gly Ala Arg His Val Val Leu Thr Ser Arg Asn Pro  
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Arg Leu Asp Pro Lys Trp Ile Ala Asn Met Glu Ala Leu Gly Gly  
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Asp Ile Thr Val Leu Ser Met Asp Val Ala Asn Glu Asp Ser Val  
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Asp Ala Gly Leu Gly Lys Leu Val Asp Met Lys Leu Pro Pro Val  
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Ala Gly Ile Ala Phe Gly Pro Leu Val Leu Gln Asp Val Met Leu  
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Lys Asn Met Asp His Gln Met Met Asp Met Val Leu Lys Pro Lys  
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Val Gln Gly Ala Arg Ile Leu His Glu Arg Phe Ser Glu Gln Thr  
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Gly Ser Lys Ala Leu Asp Phe Phe Ile Met Phe Ser Ser Ile Val  
2270 2275 2280

Ala Val Ile Gly Asn Pro Gly Gln Ser Asn Tyr Gly Ala Ala Asn  
2285 2290 2295

Ala Tyr Leu Gln Ala Leu Ala Gln Gln Arg Cys Ala Arg Gly Leu  
2300 2305 2310

Ala Gly Ser Thr Ile Asp Ile Gly Ala Val Tyr Gly Val Gly Phe  
2315 2320 2325

Val Thr Arg Ala Glu Met Glu Glu Asp Phe Asp Ala Ile Arg Phe  
2330 2335 2340

Met Phe Asp Ser Val Glu Glu His Glu Leu His Thr Leu Phe Ala  
2345 2350 2355

Glu Ala Val Val Ser Asp Gln Arg Ala Arg Gln Gln Pro Gln Arg  
2360 2365 2370

Lys Thr Val Ile Asp Met Ala Asp Leu Glu Leu Thr Thr Gly Ile  
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Pro Asp Leu Asp Pro Ala Leu Gln Asp Arg Ile Ile Tyr Phe Asn  
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Asp Pro Arg Phe Gly Asn Phe Lys Ile Pro Gly Gln Arg Gly Asp  
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Gly Gly Asp Asn Gly Ser Gly Ser Lys Gly Ser Ile Ala Asp Gln  
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Leu Lys Gln Ala Thr Thr Leu Asp Gln Val Arg Gln Ile Val Ile  
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Asp Gly Leu Ser Glu Lys Leu Arg Val Thr Leu Gln Val Ser Asp  
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Gly Glu Ser Val Asp Pro Thr Ile Pro Leu Ile Asp Gln Gly Val  
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Leu Tyr Leu Asp Leu Pro Leu Leu Arg Val Leu Gly Gly Ala Ser  
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Val Ala Asp Leu Ala Asp Asp Ala Ala Thr Arg Leu Pro Ala Thr  
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Ser Ile Pro Leu Leu Leu Gln Ile Gly Asp Ser Thr Gly Thr Ser  
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Asp Ser Gly Ala Ser Pro Thr Pro Thr Asp Ser His Asp Glu Ala  
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Ser Ser Ala Thr Ser Thr Asp Ala Ser Ser Ala Glu Glu Asp Glu  
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Glu Gln Glu Asp Asp Asn Glu Gln Gly Gly Arg Lys Ile Leu Arg  
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Arg Glu Arg Leu Ser Leu Gly Gln Glu Tyr Ser Trp Arg Gln Gln  
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Gln Met Val Lys Asp His Thr Ile Phe Asn Asn Thr Ile Gly Met  
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Phe Met Lys Gly Thr Ile Asp Leu Asp Arg Leu Arg Arg Ala Leu  
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Lys Ala Ser Leu Arg Arg His Glu Ile Phe Arg Thr Cys Phe Val  
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Thr Gly Asp Asp Tyr Ser Ser Asp Leu Asn Gly Pro Val Gln Val  
 2645 2650 2655

Val Leu Lys Asn Pro Glu Asn Arg Val His Phe Val Gln Val Asn  
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Asn Ala Ala Glu Ala Glu Glu Tyr Arg Lys Leu Glu Lys Thr  
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Asn Tyr Ser Ile Ser Thr Gly Asp Thr Leu Arg Leu Val Asp Phe  
 2690 2695 2700

Tyr Trp Gly Thr Asp Asp His Leu Leu Val Ile Gly Tyr His Arg  
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Leu Val Gly Asp Gly Ser Thr Thr Glu Asn Leu Phe Asn Glu Ile  
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Gly Gln Ile Tyr Ser Gly Val Lys Met Gln Arg Pro Ser Thr Gln  
2735 2740 2745

Phe Ser Asp Leu Ala Val Gln Gln Arg Glu Asn Leu Glu Asn Gly  
2750 2755 2760

Arg Met Gly Asp Asp Ile Ala Phe Trp Lys Ser Met His Ser Lys  
2765 2770 2775

Val Ser Ser Ser Ala Pro Thr Val Leu Pro Ile Met Asn Leu Ile  
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Asn Asp Pro Ala Ala Asn Ser Glu Gln Gln Ile Gln Pro Phe  
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Thr Trp Gln Gln Tyr Glu Ala Ile Ala Arg Leu Asp Pro Met Val  
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Ala Phe Arg Ile Lys Glu Arg Ser Arg Lys His Lys Ala Thr Pro  
2825 2830 2835

Met Gln Phe Tyr Leu Ala Ala Tyr His Val Leu Leu Ala Arg Leu  
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Thr Gly Ser Lys Asp Ile Thr Ile Gly Leu Ala Glu Thr Asn Arg  
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Ser Thr Met Glu Glu Ile Ser Ala Met Gly Phe Phe Ala Asn Val  
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Leu Pro Leu Arg Phe Asp Glu Phe Val Gly Ser Lys Thr Phe Gly  
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Glu His Leu Val Ala Thr Lys Asp Ser Val Arg Glu Ala Met Gln  
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His Ala Arg Val Pro Tyr Gly Val Ile Leu Asp Cys Leu Gly Leu  
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Asn Leu Pro Thr Ser Gly Glu Glu Pro Lys Thr Gln Thr His Ala  
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Pro Leu Phe Gln Ala Val Phe Asp Tyr Lys Gln Gly Gln Ala Glu  
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Ser Gly Ser Ile Gly Asn Ala Lys Met Thr Ser Val Leu Ala Ser  
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Arg Glu Arg Thr Pro Tyr Asp Ile Val Leu Glu Met Trp Asp Asp  
2975 . 2980 2985

Pro Thr Lys Asp Pro Leu Ile His Val Lys Leu Gln Ser Ser Leu  
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Tyr Gly Pro Glu His Ala Gln Ala Phe Val Asp His Phe Ser Ser  
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Ala Thr Ala Met Ala Gly Ser Ala Cys Ser Asn Thr Ser Thr Pro Ile
          20           25           30

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gcc ata gtt gga atg gga tgt cga ttt gct gga gat gca acg agt cca
Ala Ile Val Gly Met Gly Cys Arg Phe Ala Gly Asp Ala Thr Ser Pro
35          40          45

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gtc ccc tcc tcg cga ttc aat gtg aga gga gta tac cac ccg aat ggc
Val Pro Ser Ser Arg Phe Asn Val Arg Gly Val Tyr His Pro Asn Gly
65          70          75          80

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gaa agg gtc ggg tcc acc cac gta aag ggt gga cac ttc atc gac gag  
Glu Arg Val Gly Ser Thr His Val Lys Gly Gly His Phe Ile Asp Glu  
85 90 95

gat cct gct tta ttt gac gcc gcg ttc ttc aac atg acc aca gag gtc	Asp Pro Ala Leu Phe Asp Ala Ala Phe Phe Asn Met Thr Thr Glu Val	
100	105	110

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gcc agc tgc atg gat ccg cag tat cgg ctt atg ctt gag gtg gtc tac
Ala Ser Cys Met Asp Pro Gln Tyr Arg Leu Met Leu Glu Val Val Tyr
115          120          125

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gaa tcg ctg gag agt gcc ggt atc acc atc gat ggt atg gca ggc tct
Glu Ser Leu Glu Ser Ala Gly Ile Thr Ile Asp Gly Met Ala Gly Ser
    130           135           140

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aat acg tcg gtg ttt ggg ggt gtc atg tac cac gac tat cag gat tcg
Asn Thr Ser Val Phe Gly Gly Val Met Tyr His Asp Tyr Gln Asp Ser
145           150           155           160

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ctc aat cgt gac ccc gag aca gtt ccg cgt tat ttc ata act ggc aac Leu Asn Arg Asp Pro Glu Thr Val Pro Arg Tyr Phe Ile Thr Gly Asn 165 170 175	528
tca gga aca atg ctt tcg aac cgg ata tca cac ttc tac gac tta cgt Ser Gly Thr Met Leu Ser Asn Arg Ile Ser His Phe Tyr Asp Leu Arg 180 185 190	576
ggc ccc agc gtg acg gtt gac acg gcc tgc acg aca ttg acc gca Gly Pro Ser Val Thr Val Asp Thr Ala Cys Ser Thr Thr Leu Thr Ala 195 200 205	624
ctg cac ttg gcg tgc cag agc tta cgt act ggg gag tca gat aca gcc Leu His Leu Ala Cys Gln Ser Leu Arg Thr Gly Glu Ser Asp Thr Ala 210 215 220	672
atc gtt atc ggt gca aat ctt ctg ctc aat ccc gat gtt ttt gtt acg Ile Val Ile Gly Ala Asn Leu Leu Asn Pro Asp Val Phe Val Thr 225 230 235 240	720
atg tca aac ctg gga ttt ttg tcc ccc gat ggt atc tcg tac tct ttt Met Ser Asn Leu Gly Phe Leu Ser Pro Asp Gly Ile Ser Tyr Ser Phe 245 250 255	768
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gta ata aag gcc ctc cct aac gcg ttg cga gac caa gac cct atc cga Val Ile Lys Ala Leu Pro Asn Ala Leu Arg Asp Gln Asp Pro Ile Arg 275 280 285	864
gcc gtc att cga gag aca gcg ctg aac cag gat ggc aaa aca ccc gca Ala Val Ile Arg Glu Thr Ala Leu Asn Gln Asp Gly Lys Thr Pro Ala 290 295 300	912
att act gcg ccg agt gat gtg gcg cag aaa agt ctg atc cag gag tgc Ile Thr Ala Pro Ser Asp Val Ala Gln Lys Ser Leu Ile Gln Glu Cys 305 310 315 320	960
tac gat aag gct ggg cta gat atg tcg ttg acc tcg tac gtc gag gcc Tyr Asp Lys Ala Gly Leu Asp Met Ser Leu Thr Ser Tyr Val Glu Ala 325 330 335	1008
cac gga act gga aca cca act ggt gac ccc ctt gaa atc tca gca att His Gly Thr Gly Thr Pro Thr Gly Asp Pro Leu Glu Ile Ser Ala Ile 340 345 350	1056
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aat att ggc cat aca gaa gcc gcc agt ggc ctg gcc agt ata atc aag Asn Ile Gly His Thr Glu Ala Ala Ser Gly Leu Ala Ser Ile Ile Lys 370 375 380	1152
gtg gcc ttg gcc ttg gag aag ggc ttg att ccc cct aat ggc cgg ttc Val Ala Leu Ala Leu Glu Lys Gly Leu Ile Pro Pro Asn Ala Arg Phe 385 390 395 400	1200
ctg caa aag aac agc aag ctg atg ctt gac caa aag aac atc aag atc Leu Gln Lys Asn Ser Lys Leu Met Leu Asp Gln Lys Asn Ile Lys Ile 405 410 415	1248
ccc atg tct gct caa gac tgg cct gtc aaa gat ggg act cgt cgc gca Pro Met Ser Ala Gln Asp Trp Pro Val Lys Asp Gly Thr Arg Arg Ala 420 425 430	1296
tct gtc aat aac ttc ggc ttt ggt ggt tcg aat gct cac gtc att ttg Ser Val Asn Asn Phe Gly Phe Gly Ser Asn Ala His Val Ile Leu	1344

435	440	445	
gaa tca tat gat cgc gca tca ttg gcc ctg cca gag gat caa gtg cat Glu Ser Tyr Asp Arg Ala Ser Leu Ala Leu Pro Glu Asp Gln Val His 450	455	460	1392
gtc aat ggt aac tct gag cat ggt agg gtt gag gat ggt tcc aaa cag Val Asn Gly Asn Ser Glu His Gly Arg Val Glu Asp Gly Ser Lys Gln 465	470	475	1440
agc cgc ata tac gtt gtg cgt gcc aag gac gag caa gct tgt cgg cga Ser Arg Ile Tyr Val Val Arg Ala Lys Asp Glu Gln Ala Cys Arg Arg 485	490	495	1488
acg ata gca agc ctg cga gac tac att aaa tcc gtc gct gac att gac Thr Ile Ala Ser Leu Arg Asp Tyr Ile Lys Ser Val Ala Asp Ile Asp 500	505	510	1536
ggg gaa ccc ttc ctc gcc agc ctc gcc tat aca cta ggc tct cgc cgt Gly Glu Pro Phe Leu Ala Ser Leu Ala Tyr Thr Leu Gly Ser Arg Arg 515	520	525	1584
tcc att ctg cca tgg acg tca gtg tat gta gca gac agc ctt ggc ggc Ser Ile Leu Pro Trp Thr Ser Val Tyr Val Ala Asp Ser Leu Gly Gly 530	535	540	1632
ctt gtt tct gcc ctc agc gat gag tcc aat caa cca aaa cga gcg aat Leu Val Ser Ala Leu Ser Asp Glu Ser Asn Gln Pro Lys Arg Ala Asn 545	550	555	1680
gag aaa gta cgg ctc gga ttt gta ttc acc ggt cag ggg gcg cag tgg Glu Lys Val Arg Leu Gly Phe Val Phe Thr Gly Gln Gly Ala Gln Trp 565	570	575	1728
cat gca atg ggc aga gag ctg gtc aat aca ttc cca gta ttc aaa cag His Ala Met Gly Arg Glu Leu Val Asn Thr Phe Pro Val Phe Lys Gln 580	585	590	1776
gcg att ctt gaa tgt gat ggc tac atc aag caa ctg ggc gcg agt tgg Ala Ile Leu Glu Cys Asp Gly Tyr Ile Lys Gln Leu Gly Ala Ser Trp 595	600	605	1824
aat ttt atg gag gag ctc cac cgt gat gag ctg acg act cgg gta aat Asn Phe Met Glu Glu Leu His Arg Asp Glu Leu Thr Thr Arg Val Asn 610	615	620	1872
gat gcc gaa tac agt cta cca ctg tca acc gct atc caa att gca ctt Asp Ala Glu Tyr Ser Leu Pro Leu Ser Thr Ala Ile Gln Ile Ala Leu 625	630	635	1920
gtg cgt ctc ctt tgg tca tgg gga att cgg cca acg ggg ata acc agt Val Arg Leu Leu Trp Ser Trp Gly Ile Arg Pro Thr Gly Ile Thr Ser 645	650	655	1968
cac tca agt gga gag gct gct gcc tac gca gct ggg gct tta tcc His Ser Ser Gly Glu Ala Ala Ala Tyr Ala Ala Gly Ala Leu Ser 660	665	670	2016
gcg cgg tcg gcc att ggg atc act tat ata cgc ggt gta ttg acc act Ala Arg Ser Ala Ile Gly Ile Thr Tyr Ile Arg Gly Val Leu Thr Thr 675	680	685	2064
aag ccc aag ccc gca ttg gca gcc aaa gga gga atg atg gcg gtg ggt Lys Pro Lys Pro Ala Leu Ala Ala Lys Gly Gly Met Met Ala Val Gly 690	695	700	2112
ctt ggt cgc agt gag acc aat gtt tac att tcg cgt ctc aac cag gag Leu Gly Arg Ser Glu Thr Asn Val Tyr Ile Ser Arg Leu Asn Gln Glu 705	710	715	2160

gac ggc tgt gtg gtt gga tgt atc aac agt caa tgt agt gtg acg Asp Gly Cys Val Val Val Gly Cys Ile Asn Ser Gln Cys Ser Val Thr 725 730 735	2208
gtg tcg gga gat ttg ggt gca atc gag aaa ctt gaa aag ttg tta cac Val Ser Gly Asp Leu Gly Ala Ile Glu Lys Leu Glu Lys Leu Leu His 740 745 750	2256
gcc gat ggc atc ttt acc agg aaa ctg aaa gtc act gaa gcc ttc cat Ala Asp Gly Ile Phe Thr Arg Lys Leu Lys Val Thr Glu Ala Phe His 755 760 765	2304
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gat ctg ttc aac tcg gat aac aac aac gac aat ccc aat gct gac acc Asp Leu Phe Asn Ser Asp Asn Asn Asn Asp Asn Pro Asn Ala Asp Thr 785 790 795 800	2400
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cag ccg gta gag ttc gag tcc tca ctc cgc gag atg tgc ttt gat ccc Gln Pro Val Glu Phe Glu Ser Ser Leu Arg Glu Met Cys Phe Asp Pro 835 840 845	2544
aac acc aaa gag aaa gcc gtc gat gtg att att gaa ata ggg cct cac Asn Thr Lys Glu Lys Ala Val Asp Val Ile Ile Glu Ile Gly Pro His 850 855 860	2592
gga gcg ctt ggt ggt cca atc aac caa gtc atg cag gat ctg ggt ctg Gly Ala Leu Gly Pro Ile Asn Gln Val Met Gln Asp Leu Gly Leu 865 870 875 880	2640
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ccc aga gtg aag gta ctg agc gat ttg ccg gcg tac ccg tgg aat cac Pro Arg Val Lys Val Leu Ser Asp Leu Pro Ala Tyr Pro Trp Asn His 930 935 940	2832
caa acc cgt tat tgg aga gag cct cgc ggc agt cgt gag tcc aaa cag Gln Thr Arg Tyr Trp Arg Glu Pro Arg Gly Ser Arg Glu Ser Lys Gln 945 950 955 960	2880
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cct cat ttc gcg cct aaa tgg aaa cat gtt ctc cgt ctg tca gat att Pro His Phe Ala Pro Lys Trp Lys His Val Leu Arg Leu Ser Asp Ile 980 985 990	2976
cca tgg ata cga gat cac gtc gtt ggt tcg agc atc atc ttt ccg gga Pro Trp Ile Arg Asp His Val Val Gly Ser Ser Ile Ile Phe Pro Gly	3024

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Ala Gly Phe Ile Ser Met Ala	Ile Glu Gly Phe Ser	Gln Val Cys	
1010	1015	1020	
cca cca gtt gcg ggg gct agc	atc aac tac aac ttg	cgt gac gtt	3114
Pro Pro Val Ala Gly Ala Ser	Ile Asn Tyr Asn Leu	Arg Asp Val	
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Glu Leu Ala Gln Ala Leu Ile	Ile Pro Ala Asp Ala	Glu Ala Glu	
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gtt gac ctg cgc cta acg atc	cgt tca tgt gag gaa	agg tcc ctc	3204
Val Asp Leu Arg Leu Thr Ile	Arg Ser Cys Glu Glu	Arg Ser Leu	
1055	1060	1065	
ggc aca aag aac tgg cat caa	ttt tct gtg cac tca	att tcg ggc	3249
Gly Thr Lys Asn Trp His Gln	Phe Ser Val His Ser	Ile Ser Gly	
1070	1075	1080	
gaa aat aat acc tgg aca gaa	cac tgc acc gga tta	ata cgt tcg	3294
Glu Asn Asn Thr Trp Thr Glu	His Cys Thr Gly Leu	Ile Arg Ser	
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gag agc gaa aga agc cac ctt	gac tgt tca act gtg	gaa gcc tca	3339
Glu Ser Glu Arg Ser His Leu	Asp Cys Ser Thr Val	Glu Ala Ser	
1100	1105	1110	
cgc agg ttg aat cta ggc tca	gat aac cgg agc att	gat ccc aac	3384
Arg Arg Leu Asn Leu Gly Ser	Asp Asn Arg Ser Ile	Asp Pro Asn	
1115	1120	1125	
gat ctc tgg gag tcc tta cac	gcg aat ggg ata tgc	cac gga ccc	3429
Asp Leu Trp Glu Ser Leu His	Ala Asn Gly Ile Cys	His Gly Pro	
1130	1135	1140	
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Ile Phe Gln Asn Ile Gln Arg	Ile Gln Asn Asn Gly	Gln Gly Ser	
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Phe Cys Arg Phe Ser Ile Ala	Asp Thr Ala Ser Ala	Met Pro His	
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Ser Tyr Glu Asn Arg His Ile	Val His Pro Thr Thr	Leu Asp Ser	
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1205	1210	1215	
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Gln Ala Ser Ile Lys Asp Arg	Asn Ser Gln Ser Phe	Ser Thr Asp	
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Gly Ile	Pro Val Ile Glu Ile	Glu Gly Leu Val Phe	Gln Ser Val	
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gga agc	agc ttc tct gac caa	aag tca gac tcc aac	gac aca gaa	3879
Gly Ser	Ser Phe Ser Asp Gln	Lys Ser Asp Ser Asn	Asp Thr Glu	
1280	1285	1290		
aat gcc	tgc agc tcc tgg gtt	tgg gcc cct gac atc	agc ttg ggt	3924
Asn Ala	Cys Ser Ser Trp Val	Trp Ala Pro Asp Ile	Ser Leu Gly	
1295	1300	1305		
gac tcc	act tgg ctc aaa gaa	aag ttg agc act gag	gct gag acg	3969
Asp Ser	Thr Trp Leu Lys Glu	Lys Leu Ser Thr Glu	Ala Glu Thr	
1310	1315	1320		
aaa gaa	acg gaa ctc atg atg	gac ctc cga aga tgc	acg atc aac	4014
Lys Glu	Thr Glu Leu Met Met	Asp Leu Arg Arg Cys	Thr Ile Asn	
1325	1330	1335		
ttt ata	cag gag gct gtc act	gat ttg aca aat tct	gat atc caa	4059
Phe Ile	Gln Glu Ala Val Thr	Asp Leu Thr Asn Ser	Asp Ile Gln	
1340	1345	1350		
cat ctg	gat ggc cac ctt cag	aag tat ttc gat tgg	atg aat gtc	4104
His Leu	Asp Gly His Leu Gln	Lys Tyr Phe Asp Trp	Met Asn Val	
1355	1360	1365		
caa ttg	gac ctt gcg aga caa	aac aag ctc agc cca	gcc agt tgc	4149
Gln Leu	Asp Leu Ala Arg Gln	Asn Lys Leu Ser Pro	Ala Ser Cys	
1370	1375	1380		
gac tgg	cta agt gac gat gct	gag cag aag aaa tgc	cta cag gcc	4194
Asp Trp	Leu Ser Asp Asp Ala	Glu Gln Lys Lys Cys	Leu Gln Ala	
1385	1390	1395		
aga gtc	gct gga gaa agc gtc	aat ggc gag atg att	tct cgt cta	4239
Arg Val	Ala Gly Glu Ser Val	Asn Gly Glu Met Ile	Ser Arg Leu	
1400	1405	1410		
gga cct	cag tta ata gca atg	cta cgc cgc gaa aca	gag cca ctt	4284
Gly Pro	Gln Leu Ile Ala Met	Leu Arg Arg Glu Thr	Glu Pro Leu	
1415	1420	1425		
gag ttg	atg atg caa gat cag	ctg cta agc aga tac	tac gtc aac	4329
Glu Leu	Met Met Gln Asp Gln	Leu Leu Ser Arg Tyr	Tyr Val Asn	
1430	1435	1440		
gca atc	aaa tgg agc cga tca	aac gca caa gcc agc	gag ctg atc	4374
Ala Ile	Lys Trp Ser Arg Ser	Asn Ala Gln Ala Ser	Glu Leu Ile	
1445	1450	1455		
cga ctt	tgc gcc cac aag aac	ccg cgt tct cgc att	ttg gag att	4419
Arg Leu	Cys Ala His Lys Asn	Pro Arg Ser Arg Ile	Leu Glu Ile	
1460	1465	1470		
ggc gga	ggc acg ggc tgc	aca aag ctt att gtc	aat gca ttg	4464
Gly Gly	Gly Thr Gly Gly Cys	Thr Lys Leu Ile Val	Asn Ala Leu	
1475	1480	1485		
gga aac	acc aag ccg atc gat	cgt tat gac ttc acc	gat gtg tct	4509
Gly Asn	Thr Lys Pro Ile Asp	Arg Tyr Asp Phe Thr	Asp Val Ser	
1490	1495	1500		
gcc ggg	ttt ttc gag tgc gcg	cgt gag caa ttt gcg	gat tgg caa	4554
Ala Gly	Phe Phe Glu Ser Ala	Arg Glu Gln Phe Ala	Asp Trp Gln	
1505	1510	1515		
gac gtg	atg act ttc aaa aaa	ttg gat att gaa agc	gat ccc gag	4599
Asp Val	Met Thr Phe Lys Lys	Leu Asp Ile Glu Ser	Asp Pro Glu	

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caa caa ggg ttt gaa tgt gcc acc tac gat gtg gtc	1535	1540	gtg gct tgc
Gln Gln Gly Phe Glu Cys Ala Thr Tyr Asp Val Val			Val Ala Cys
1545			
cag gtc ctg cat gca act cga tgc atg aaa cga aca	1550	1555	ctg agt aac
Gln Val Leu His Ala Thr Arg Cys Met Lys Arg Thr			Leu Ser Asn
1560			
gtt cga aaa ttg ctc aag cct ggg ggc aac ttg att	1565	1570	ttg gtt gag
Val Arg Lys Leu Leu Lys Pro Gly Gly Asn Leu Ile			Leu Val Glu
1575			
act acc agg gat cag ctc gat ttg ttc ttt acc ttc	1580	1585	gga ctg ttg
Thr Thr Arg Asp Gln Leu Asp Leu Phe Thr Phe			Gly Leu Leu
1590			
cca ggt tgg tgg ctc agt gag gag cct gag cgg aag	1595	1600	tcg acg cca
Pro Gly Trp Trp Leu Ser Glu Glu Pro Glu Arg Lys			Ser Thr Pro
1605			
tcg ctc act acc gat ctt tgg aac acc atg ttg gac	1610	1615	acg agc ggt
Ser Leu Thr Thr Asp Leu Trp Asn Thr Met Leu Asp			Thr Ser Gly
1620			
tcc aac ggt gtg gaa ttg gag gtt cgt gat tgt gaa	1625	1630	gac gat gag
Phe Asn Gly Val Glu Leu Glu Val Arg Asp Cys Glu			Asp Asp Glu
1635			
ttt tac atg atc agc aca atg cta tcg acg gct aga	1640	1645	aaa gag aat
Phe Tyr Met Ile Ser Thr Met Leu Ser Thr Ala Arg			Lys Glu Asn
1650			
aca acc ccg gat aca gtg gca gaa tcg gag gtg ctt	1655	1660	ttg ctg cac
Thr Thr Pro Asp Thr Val Ala Glu Ser Glu Val Leu			Leu Leu His
1665			
gga gcg Ctc cga cct cct tca tct tgg ctg gaa agt	1670	1675	ctc cag gca
Gly Ala Leu Arg Pro Pro Ser Ser Trp Leu Glu Ser			Leu Gln Ala
1680			
gca att tgt gaa aag acc agt tct agc cca tcg atc	1685	1690	aac gct ctg
Ala Ile Cys Glu Lys Thr Ser Ser Ser Pro Ser Ile			Asn Ala Leu
1695			
ggc gag gta gat acc act gga agg aca tcg att ttt	1700	1705	ctt ggg gaa
Gly Glu Val Asp Thr Thr Gly Arg Thr Cys Ile Phe			Leu Gly Glu
1710			
atg gag tcc tcg ctc ctt gga gag gtg gga agc gag	1715	1720	acc ttc aaa
Met Glu Ser Ser Leu Leu Gly Glu Val Gly Ser Glu			Thr Phe Lys
1725			
tcc atc acc gcg atg ctg aat aac tgc aac gca ctt	1730	1735	ctc tgg gtg
Ser Ile Thr Ala Met Leu Asn Asn Cys Asn Ala Leu			Leu Trp Val
1740			
tct aga gga gca gcc atg agc tcc gag gat cca tgg	1745	1750	aaa gct cta
Ser Arg Gly Ala Ala Met Ser Ser Glu Asp Pro Trp			Lys Ala Leu
1755			
cat att ggt ctg ctg cgt acc atc cgc aac gaa aat	1760	1765	aac ggg aag
His Ile Gly Leu Leu Arg Thr Ile Arg Asn Glu Asn			Asn Gly Lys
1770			
gaa tat gta tcg ttg gat ctc gat cct tct cga aac	1775	1780	gca tac acc
Glu Tyr Val Ser Leu Asp Leu Asp Pro Ser Arg Asn			Ala Tyr Thr
1785			

cac	gag	tcc	ctg	tat	gct	atc	tgc	aat	atc	ttc	aat	ggc	cgc	ctc	5409	
His	Glu	Ser	Leu	Tyr	Ala	Ile	Cys	Asn	Ile	Phe	Asn	Gly	Arg	Leu		
1790						1795					1800					
ggc	gac	ctt	tcc	gaa	gac	aag	gag	ttt	gaa	ttt	gca	gag	aga	aac	5454	
Gly	Asp	Leu	Ser	Glu	Asp	Lys	Glu	Phe	Glu	Phe	Ala	Glu	Arg	Asn		
1805						1810					1815					
ggc	gtc	atc	cac	gta	ccg	cga	ctt	ttc	aat	gac	ccg	cac	tgg	aag	5499	
Gly	Val	Ile	His	Val	Pro	Arg	Leu	Phe	Asn	Asp	Pro	His	Trp	Lys		
1820						1825					1830					
gac	caa	gaa	gcg	gtt	gag	gtc	aca	ctg	cag	ccg	ttc	gag	caa	ccc	5544	
Asp	Gln	Glu	Ala	Val	Glu	Val	Thr	Leu	Gln	Pro	Phe	Glu	Gln	Pro		
1835						1840					1845					
ggg	cgt	cgt	ctg	cgg	atg	gag	gtt	gag	acg	cca	ggg	ctc	tta	gac	5589	
Gly	Arg	Arg	Leu	Arg	Met	Glu	Val	Glu	Thr	Pro	Gly	Leu	Leu	Asp		
1850						1855					1860					
tcc	ctg	caa	ttt	cga	gac	gac	gaa	gga	cgt	gaa	ggc	aag	gat	ctt	5634	
Ser	Leu	Gln	Phe	Arg	Asp	Asp	Glu	Gly	Arg	Glu	Gly	Lys	Asp	Leu		
1865						1870					1875					
ccg	gat	gat	tgg	gta	gaa	atc	gaa	ccc	aaa	gct	ttc	ggg	ctc	aat	5679	
Pro	Asp	Asp	Trp	Val	Glu	Ile	Glu	Pro	Lys	Ala	Phe	Gly	Leu	Asn		
1880						1885					1890					
ttt	cg	gat	gtc	atg	gtt	gcc	atg	gg	caa	ttg	gag	gcc	aa	cgt	5724	
Phe	Arg	Asp	Val	Met	Val	Ala	Met	Gly	Gln	Leu	Glu	Ala	Asn	Arg		
1895						1900					1905					
gtg	atg	ggc	tcc	gaa	tgc	gcc	gga	gtg	atc	aca	aag	ctc	gg	g	5769	
Val	Met	Gly	Phe	Glu	Cys	Ala	Gly	Val	Ile	Thr	Lys	Leu	Gly	Gly		
1910						1915					1920					
gct	gct	gct	gct	agc	caa	ggc	ctc	aga	tta	ggg	gac	cg	gta	tgt	5814	
Ala	Ala	Ala	Ala	Ser	Gln	Gly	Leu	Arg	Leu	Gly	Asp	Arg	Val	Cys		
1925						1930					1935					
gca	cta	ctg	aaa	ggc	cat	tgg	g	cg	acc	aga	aca	cag	ac	ccg	ta	5859
Ala	Leu	Leu	Lys	Gly	His	Trp	Ala	Thr	Arg	Thr	Gln	Thr	Pro	Tyr		
1940						1945					1950					
act	aat	gtc	gtc	cgt	att	ccg	gac	gaa	atg	ggc	ttc	cca	gaa	gcc	5904	
Thr	Asn	Val	Val	Arg	Ile	Pro	Asp	Glu	Met	Gly	Phe	Pro	Glu	Ala		
1955						1960					1965					
gct	tcg	gtc	ccc	ctg	gct	ttc	act	acc	gca	tat	att	g	cg	ttt	tat	5949
Ala	Ser	Val	Pro	Leu	Ala	Phe	Thr	Thr	Ala	Tyr	Ile	Ala	Leu	Tyr		
1970						1975					1980					
acc	acg	gca	aag	cta	cga	cga	ggc	gaa	aga	gtc	ttg	atc	cac	agt	5994	
Thr	Thr	Ala	Lys	Leu	Arg	Arg	Gly	Glu	Arg	Val	Leu	Ile	His	Ser		
1985						1990					1995					
gga	gct	gga	ggc	gtc	ggt	caa	gca	g	cg	atc	att	ttg	tcc	cag	ctt	6039
Gly	Ala	Gly	Gly	Val	Gly	Gln	Ala	Ala	Ile	Ile	Leu	Ser	Gln	Leu		
2000						2005					2010					
g	cg	g	gt	g	tt	g	ac	g	g	atc	ca	g	cc	aa	cg	5084
Ala	Gly	Ala	Glu	Val	Phe	Val	Thr	Ala	Gly	Thr	Gln	Ala	Lys	Arg		
2015						2020					2025					
gac	ttt	gtc	ggc	gat	aaa	ttc	ggc	atc	aat	ccg	gat	cat	atc	ttc	6129	
Asp	Phe	Val	Gly	Asp	Lys	Phe	Gly	Ile	Asn	Pro	Asp	His	Ile	Phe		
2030						2035					2040					
tcg	agc	agg	aat	gac	tta	ttc	gtc	gac	ggc	atc	aaa	gcc	tac	acg	6174	
Ser	Ser	Arg	Asn	Asp	Leu	Phe	Val	Asp	Gly	Ile	Lys	Ala	Tyr	Thr		

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Gly Gly Leu Gly Val His Val	Val Leu Asn Ser Leu	Ala Gly Gln	
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ctc ctc caa gca agc ttt gac	tgc atg gcc gaa ttc	gac aga ttt	6264
Leu Leu Gln Ala Ser Phe Asp	Cys Met Ala Glu Phe	Gly Arg Phe	
2075 2080	2085	2085	
gtt gag att gga aaa aag gac	ctg gag caa aac agc	aga ctt gac	6309
Val Glu Ile Gly Lys Lys Asp	Leu Glu Gln Asn Ser	Arg Leu Asp	
2090 2095	2100	2100	
atg ctg cca ttc acc cgg gac	gtc tct ttc aca tca	att gat ctt	6354
Met Leu Pro Phe Thr Arg Asp	Val Ser Phe Thr Ser	Ile Asp Leu	
2105 2110	2115	2115	
ctc tcg tgg caa aga gcc aaa	agt gaa gaa gta tcc	gaa gcg ttg	6399
Leu Ser Trp Gln Arg Ala Lys	Ser Glu Glu Val Ser	Glu Ala Leu	
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aac cat gtc aca aaa ctc ctc	gag aca aaa gcg att	ggc ttg att	6444
Asn His Val Thr Lys Leu Leu	Glu Thr Lys Ala Ile	Gly Leu Ile	
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ggt cca atc cag cag cac tcc	ttg tca aac atc gag	aag gcc ttc	6489
Gly Pro Ile Gln Gln His Ser	Leu Ser Asn Ile Glu	Lys Ala Phe	
2150 2155	2160	2160	
cgt acg atg cag agt ggt cag	cat gtt ggc aaa gtt	gtg gtc aat	6534
Arg Thr Met Gln Ser Gly Gln	His Val Gly Lys Val	Val Val Asn	
2165 2170	2175	2175	
gta tct ggg gac gaa ctg gtc	cca gtc ggc gat gga	ggg ttc tcg	6579
Val Ser Gly Asp Glu Leu Val	Pro Val Gly Asp Gly	Gly Phe Ser	
2180 2185	2190	2190	
ctg aag ctg aag cct gac agt	tct tac cta gtt gct	gtt ggg ctg	6624
Leu Lys Leu Lys Pro Asp Ser	Ser Tyr Leu Val Ala	Gly Gly Leu	
2195 2200	2205	2205	
ggg gga att gga aag cag atc	tgt cag tgg ctt gtt	gat cat ggc	6669
Gly Gly Ile Gly Lys Gln Ile	Cys Gln Trp Leu Val	Asp His Gly	
2210 2215	2220	2220	
gcg aag cac ttg att atc cta	tcg aga agt gca aag	gcc agt cca	6714
Ala Lys His Leu Ile Ile Leu	Ser Arg Ser Ala Lys	Ala Ser Pro	
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ttc ata acc agc ttg caa aat	caa cag tgc gct gtc	tat cta cac	6759
Phe Ile Thr Ser Leu Gln Asn	Gln Gln Cys Ala Val	Tyr Leu His	
2240 2245	2250	2250	
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Ala Cys Asp Ile Ser Asp Gln	Asp Gln Val Thr Lys	Val Leu Arg	
2255 2260	2265	2265	
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Leu Cys Glu Glu Ala His Ala	Pro Pro Ile Arg Gly	Ile Ile Gln	
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ggt gcc atg gtt ctc aag gac	gcg ctt cta tcg cga	atg aca ttg	6894
Gly Ala Met Val Leu Lys Asp	Ala Leu Leu Ser Arg	Met Thr Leu	
2285 2290	2295	2295	
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Asp Glu Phe Asn Ala Ala Thr	Arg Pro Lys Val Gln	Gly Ser Trp	
2300 2305	2310	2310	

tat	ctt	cac	aag	atc	gca	cag	gat	gtt	gac	ttc	ttc	gtg	atg	ctc	6984
Tyr	Leu	His	Lys	Ile	Ala	Gln	Asp	Val	Asp	Phe	Phe	Val	Met	Leu	
2315						2320					2325				
tca	tcc	ctt	gtt	ggg	gtc	atg	ggt	ggg	gca	ggc	cag	gcc	aat	tac	7029
Ser	Ser	Leu	Val	Gly	Val	Met	Gly	Gly	Ala	Gly	Gln	Ala	Asn	Tyr	
2330						2335					2340				
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Ala	Ala	Ala	Gly	Ala	Phe	Gln	Asp	Ala	Leu	Ala	His	His	Arg	Arg	
2345						2350					2355				
gcc	cat	ggc	atg	ccg	gct	gtc	acc	att	gac	ttg	ggc	atg	gtc	aag	7119
Ala	His	Gly	Met	Pro	Ala	Val	Thr	Ile	Asp	Leu	Gly	Met	Val	Lys	
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Leu	Ala	Arg	Ile	Gly	Tyr	Lys	Pro	Met	His	Glu	Lys	Asp	Val	Met	
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Asp	Val	Leu	Glu	Lys	Ala	Ile	Leu	Cys	Ser	Ser	Pro	Gln	Phe	Pro	
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Ser	Pro	Pro	Ala	Ala	Val	Val	Thr	Gly	Ile	Asn	Thr	Ser	Pro	Gly	
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Ala	His	Trp	Thr	Glu	Ala	Asn	Trp	Ile	Gln	Glu	Gln	Arg	Phe	Val	
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Gly	Leu	Lys	Tyr	Arg	Gln	Val	Leu	His	Ala	Asp	Gln	Ser	Phe	Val	
2450						2455					2460				
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Ser	Ser	His	Lys	Lys	Gly	Pro	Asp	Gly	Val	Arg	Ala	Gln	Leu	Ser	
2465						2470					2475				
agg	gtc	acc	tct	cac	gac	gag	gcc	att	tct	atc	gtc	ctc	aaa	gca	7479
Arg	Val	Thr	Ser	His	Asp	Glu	Ala	Ile	Ser	Ile	Val	Leu	Lys	Ala	
2480						2485					2490				
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Met	Thr	Glu	Lys	Leu	Met	Arg	Met	Phe	Gly	Leu	Ala	Glu	Asp	Asp	
2495						2500					2505				
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Met	Ser	Ser	Ser	Lys	Asn	Leu	Ala	Gly	Val	Gly	Val	Asp	Ser	Leu	
2510						2515					2520				
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Val	Ala	Ile	Glu	Leu	Arg	Asn	Trp	Ile	Thr	Ser	Glu	Ile	His	Val	
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Asp	Val	Ser	Ile	Phe	Glu	Leu	Met	Asn	Gly	Asn	Thr	Ile	Ala	Gly	
2540						2545					2550				
ctc	gtc	gag	tta	gtt	gtg	gcg	aaa	tgc	agt	taa					7692
Leu	Val	Glu	Leu	Val	Val	Ala	Lys	Cys	Ser						
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Ala Thr Ala Met Ala Gly Ser Ala Cys Ser Asn Thr Ser Thr Pro Ile  
 20 25 30

Ala Ile Val Gly Met Gly Cys Arg Phe Ala Gly Asp Ala Thr Ser Pro  
 35 40 45

Gln Lys Leu Trp Glu Met Val Glu Arg Gly Gly Ser Ala Trp Ser Lys  
 50 55 60

Val Pro Ser Ser Arg Phe Asn Val Arg Gly Val Tyr His Pro Asn Gly  
 65 70 75 80

Glu Arg Val Gly Ser Thr His Val Lys Gly Gly His Phe Ile Asp Glu  
 85 90 95

Asp Pro Ala Leu Phe Asp Ala Ala Phe Phe Asn Met Thr Thr Glu Val  
 100 105 110

Ala Ser Cys Met Asp Pro Gln Tyr Arg Leu Met Leu Glu Val Val Tyr  
 115 120 125

Glu Ser Leu Glu Ser Ala Gly Ile Thr Ile Asp Gly Met Ala Gly Ser  
 130 135 140

Asn Thr Ser Val Phe Gly Gly Val Met Tyr His Asp Tyr Gln Asp Ser  
 145 150 155 160

Leu Asn Arg Asp Pro Glu Thr Val Pro Arg Tyr Phe Ile Thr Gly Asn  
 165 170 175

Ser Gly Thr Met Leu Ser Asn Arg Ile Ser His Phe Tyr Asp Leu Arg  
 180 185 190

Gly Pro Ser Val Thr Val Asp Thr Ala Cys Ser Thr Thr Leu Thr Ala  
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Leu His Leu Ala Cys Gln Ser Leu Arg Thr Gly Glu Ser Asp Thr Ala  
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Ile Val Ile Gly Ala Asn Leu Leu Asn Pro Asp Val Phe Val Thr  
 225 230 235 240

Met Ser Asn Leu Gly Phe Leu Ser Pro Asp Gly Ile Ser Tyr Ser Phe  
 245 250 255

Asp Pro Arg Ala Asn Gly Tyr Gly Arg Gly Glu Gly Ile Ala Ala Leu  
 260 265 270

Val Ile Lys Ala Leu Pro Asn Ala Leu Arg Asp Gln Asp Pro Ile Arg  
 275 280 285

Ala Val Ile Arg Glu Thr Ala Leu Asn Gln Asp Gly Lys Thr Pro Ala  
 290 295 300

Ile Thr Ala Pro Ser Asp Val Ala Gln Lys Ser Leu Ile Gln Glu Cys  
 305 310 315 320

Tyr Asp Lys Ala Gly Leu Asp Met Ser Leu Thr Ser Tyr Val Glu Ala  
 325 330 335

His Gly Thr Gly Thr Pro Thr Gly Asp Pro Leu Glu Ile Ser Ala Ile  
 340 345 350

Ser Ala Ala Phe Lys Gly His Pro Leu His Leu Gly Ser Val Lys Ala  
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Asn Ile Gly His Thr Glu Ala Ala Ser Gly Leu Ala Ser Ile Ile Lys  
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Val Ala Leu Ala Leu Glu Lys Gly Leu Ile Pro Pro Asn Ala Arg Phe  
 385 390 395 400

Leu Gln Lys Asn Ser Lys Leu Met Leu Asp Gln Lys Asn Ile Lys Ile  
 405 410 415

Pro Met Ser Ala Gln Asp Trp Pro Val Lys Asp Gly Thr Arg Arg Ala  
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Ser Val Asn Asn Phe Gly Phe Gly Ser Asn Ala His Val Ile Leu  
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Glu Ser Tyr Asp Arg Ala Ser Leu Ala Leu Pro Glu Asp Gln Val His  
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Val Asn Gly Asn Ser Glu His Gly Arg Val Glu Asp Gly Ser Lys Gln  
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Ser Arg Ile Tyr Val Val Arg Ala Lys Asp Glu Gln Ala Cys Arg Arg  
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Thr Ile Ala Ser Leu Arg Asp Tyr Ile Lys Ser Val Ala Asp Ile Asp  
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Gly Glu Pro Phe Leu Ala Ser Leu Ala Tyr Thr Leu Gly Ser Arg Arg  
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Ser Ile Leu Pro Trp Thr Ser Val Tyr Val Ala Asp Ser Leu Gly Gly  
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Leu Val Ser Ala Leu Ser Asp Glu Ser Asn Gln Pro Lys Arg Ala Asn  
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Glu Lys Val Arg Leu Gly Phe Val Phe Thr Gly Gln Gly Ala Gln Trp  
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His Ala Met Gly Arg Glu Leu Val Asn Thr Phe Pro Val Phe Lys Gln  
 580 585 590

Ala Ile Leu Glu Cys Asp Gly Tyr Ile Lys Gln Leu Gly Ala Ser Trp  
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Asn Phe Met Glu Glu Leu His Arg Asp Glu Leu Thr Thr Arg Val Asn  
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Val Arg Leu Leu Trp Ser Trp Gly Ile Arg Pro Thr Gly Ile Thr Ser  
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His Ser Ser Gly Glu Ala Ala Ala Ala Tyr Ala Ala Gly Ala Leu Ser  
 660 665 670

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 675 680 685

Lys Pro Lys Pro Ala Leu Ala Ala Lys Gly Gly Met Met Ala Val Gly  
 690 695 700

Leu Gly Arg Ser Glu Thr Asn Val Tyr Ile Ser Arg Leu Asn Gln Glu  
 705 710 715 720

Asp Gly Cys Val Val Val Gly Cys Ile Asn Ser Gln Cys Ser Val Thr  
 725 730 735

Val Ser Gly Asp Leu Gly Ala Ile Glu Lys Leu Glu Lys Leu Leu His  
 740 745 750

Ala Asp Gly Ile Phe Thr Arg Lys Leu Lys Val Thr Glu Ala Phe His  
 755 760 765

Ser Ser His Met Arg Pro Met Ala Asp Ala Phe Gly Ala Ser Leu Arg  
 770 775 780

Asp Leu Phe Asn Ser Asp Asn Asn Asn Asp Asn Pro Asn Ala Asp Thr  
 785 790 795 800

Ser Lys Gly Val Leu Tyr Ser Ser Pro Lys Thr Gly Ser Arg Met Thr  
 805 810 815

Asp Leu Lys Leu Leu Leu Asp Pro Thr His Trp Met Asp Ser Met Leu  
 820 825 830

Gln Pro Val Glu Phe Glu Ser Ser Leu Arg Glu Met Cys Phe Asp Pro  
 835 840 845

Asn Thr Lys Glu Lys Ala Val Asp Val Ile Ile Glu Ile Gly Pro His  
 850 855 860

Gly Ala Leu Gly Gly Pro Ile Asn Gln Val Met Gln Asp Leu Gly Leu  
 865 870 875 880

Lys Gly Thr Asp Ile Asn Tyr Leu Ser Cys Leu Ser Arg Gly Arg Ser  
 885 890 895

Ser Leu Glu Thr Met Tyr Arg Ala Ala Thr Glu Leu Ile Ser Lys Gly  
 900 905 910

Tyr Gly Leu Lys Met Asp Ala Ile Asn Phe Pro His Gly Arg Lys Glu  
 915 920 925

Pro Arg Val Lys Val Leu Ser Asp Leu Pro Ala Tyr Pro Trp Asn His  
 930 935 940

Gln Thr Arg Tyr Trp Arg Glu Pro Arg Gly Ser Arg Glu Ser Lys Gln  
 945 950 955 960

Arg Thr His Pro Pro His Thr Leu Ile Gly Ser Arg Glu Ser Leu Ser  
 965 970 975

Pro His Phe Ala Pro Lys Trp Lys His Val Leu Arg Leu Ser Asp Ile  
 980 985 990

Pro Trp Ile Arg Asp His Val Val Gly Ser Ser Ile Ile Phe Pro Gly  
 995 1000 1005

Ala Gly Phe Ile Ser Met Ala Ile Glu Gly Phe Ser Gln Val Cys  
 1010 1015 1020

Pro Pro Val Ala Gly Ala Ser Ile Asn Tyr Asn Leu Arg Asp Val  
 1025 1030 1035

Glu Leu Ala Gln Ala Leu Ile Ile Pro Ala Asp Ala Glu Ala Glu  
 1040 1045 1050

Val Asp Leu Arg Leu Thr Ile Arg Ser Cys Glu Glu Arg Ser Leu  
 1055 1060 1065

Gly Thr Lys Asn Trp His Gln Phe Ser Val His Ser Ile Ser Gly  
 1070 1075 1080

Glu Asn Asn Thr Trp Thr Glu His Cys Thr Gly Leu Ile Arg Ser  
 1085 1090 1095

Glu Ser Glu Arg Ser His Leu Asp Cys Ser Thr Val Glu Ala Ser  
 1100 1105 1110

Arg Arg Leu Asn Leu Gly Ser Asp Asn Arg Ser Ile Asp Pro Asn  
 1115 1120 1125

Asp Leu Trp Glu Ser Leu His Ala Asn Gly Ile Cys His Gly Pro  
 1130 1135 1140

Ile Phe Gln Asn Ile Gln Arg Ile Gln Asn Asn Gly Gln Gly Ser  
 1145 1150 1155

Phe Cys Arg Phe Ser Ile Ala Asp Thr Ala Ser Ala Met Pro His  
 1160 1165 1170

Ser Tyr Glu Asn Arg His Ile Val His Pro Thr Thr Leu Asp Ser  
 1175 1180 1185

Val Ile Gln Ala Ala Tyr Thr Val Leu Pro Tyr Ala Gly Thr Arg  
 1190 1195 1200

Met Lys Thr Ala Met Val Pro Arg Arg Leu Arg Asn Val Lys Ile  
 1205 1210 1215

Ser Ser Ser Leu Ala Asp Leu Glu Ala Gly Asp Ala Leu Asp Ala  
 1220 1225 1230

Gln Ala Ser Ile Lys Asp Arg Asn Ser Gln Ser Phe Ser Thr Asp  
 1235 1240 1245

Leu Ala Val Phe Asp Asp Tyr Asp Ser Gly Ser Ser Pro Ser Asp  
 1250 1255 1260

Gly Ile Pro Val Ile Glu Ile Glu Gly Leu Val Phe Gln Ser Val  
 1265 1270 1275

Gly Ser Ser Phe Ser Asp Gln Lys Ser Asp Ser Asn Asp Thr Glu  
 1280 1285 1290

Asn Ala Cys Ser Ser Trp Val Trp Ala Pro Asp Ile Ser Leu Gly  
 1295 1300 1305

Asp Ser Thr Trp Leu Lys Glu Lys Leu Ser Thr Glu Ala Glu Thr  
 1310 1315 1320

Lys Glu Thr Glu Leu Met Met Asp Leu Arg Arg Cys Thr Ile Asn  
 1325 1330 1335

Phe Ile Gln Glu Ala Val Thr Asp Leu Thr Asn Ser Asp Ile Gln  
 1340 1345 1350

His Leu Asp Gly His Leu Gln Lys Tyr Phe Asp Trp Met Asn Val  
 1355 1360 1365

Gln Leu Asp Leu Ala Arg Gln Asn Lys Leu Ser Pro Ala Ser Cys  
 1370 1375 1380

Asp Trp Leu Ser Asp Asp Ala Glu Gln Lys Lys Cys Leu Gln Ala  
 1385 1390 1395

Arg Val Ala Gly Glu Ser Val Asn Gly Glu Met Ile Ser Arg Leu  
 1400 1405 1410

Gly Pro Gln Leu Ile Ala Met Leu Arg Arg Glu Thr Glu Pro Leu  
 1415 1420 1425

Glu Leu Met Met Gln Asp Gln Leu Leu Ser Arg Tyr Tyr Val Asn  
 1430 1435 1440

Ala Ile Lys Trp Ser Arg Ser Asn Ala Gln Ala Ser Glu Leu Ile  
 1445 1450 1455

Arg Leu Cys Ala His Lys Asn Pro Arg Ser Arg Ile Leu Glu Ile  
 1460 1465 1470

Gly Gly Gly Thr Gly Cys Thr Lys Leu Ile Val Asn Ala Leu  
 1475 1480 1485

Gly Asn Thr Lys Pro Ile Asp Arg Tyr Asp Phe Thr Asp Val Ser  
 1490 1495 1500

Ala Gly Phe Phe Glu Ser Ala Arg Glu Gln Phe Ala Asp Trp Gln  
 1505 1510 1515

Asp Val Met Thr Phe Lys Lys Leu Asp Ile Glu Ser Asp Pro Glu  
 1520 1525 1530

Gln Gln Gly Phe Glu Cys Ala Thr Tyr Asp Val Val Val Ala Cys  
 1535 1540 1545

Gln Val Leu His Ala Thr Arg Cys Met Lys Arg Thr Leu Ser Asn  
 1550 1555 1560

Val Arg Lys Leu Leu Lys Pro Gly Gly Asn Leu Ile Leu Val Glu  
 1565 1570 1575

Thr Thr Arg Asp Gln Leu Asp Leu Phe Phe Thr Phe Gly Leu Leu  
 1580 1585 1590

Pro Gly Trp Trp Leu Ser Glu Glu Pro Glu Arg Lys Ser Thr Pro  
 1595 1600 1605

Ser Leu Thr Thr Asp Leu Trp Asn Thr Met Leu Asp Thr Ser Gly  
 1610 1615 1620

Phe Asn Gly Val Glu Leu Glu Val Arg Asp Cys Glu Asp Asp Glu  
 1625 1630 1635

Phe Tyr Met Ile Ser Thr Met Leu Ser Thr Ala Arg Lys Glu Asn  
 1640 1645 1650

Thr Thr Pro Asp Thr Val Ala Glu Ser Glu Val Leu Leu Leu His  
 1655 1660 1665

Gly Ala Leu Arg Pro Pro Ser Ser Trp Leu Glu Ser Leu Gln Ala  
 1670 1675 1680

Ala Ile Cys Glu Lys Thr Ser Ser Ser Pro Ser Ile Asn Ala Leu  
 1685 1690 1695

Gly Glu Val Asp Thr Thr Gly Arg Thr Cys Ile Phe Leu Gly Glu  
 1700 1705 1710

Met Glu Ser Ser Leu Leu Gly Glu Val Gly Ser Glu Thr Phe Lys  
 1715 1720 1725

Ser Ile Thr Ala Met Leu Asn Asn Cys Asn Ala Leu Leu Trp Val  
 1730 1735 1740

Ser Arg Gly Ala Ala Met Ser Ser Glu Asp Pro Trp Lys Ala Leu  
 1745 1750 1755

His Ile Gly Leu Leu Arg Thr Ile Arg Asn Glu Asn Asn Gly Lys  
 1760 1765 1770

Glu Tyr Val Ser Leu Asp Leu Asp Pro Ser Arg Asn Ala Tyr Thr  
 1775 1780 1785

His Glu Ser Leu Tyr Ala Ile Cys Asn Ile Phe Asn Gly Arg Leu  
 1790 1795 1800

Gly Asp Leu Ser Glu Asp Lys Glu Phe Glu Phe Ala Glu Arg Asn  
 1805 1810 1815

Gly Val Ile His Val Pro Arg Leu Phe Asn Asp Pro His Trp Lys  
 1820 1825 1830

Asp Gln Glu Ala Val Glu Val Thr Leu Gln Pro Phe Glu Gln Pro  
 1835 1840 1845

Gly Arg Arg Leu Arg Met Glu Val Glu Thr Pro Gly Leu Leu Asp  
 1850 1855 1860

Ser Leu Gln Phe Arg Asp Asp Glu Gly Arg Glu Gly Lys Asp Leu  
 1865 1870 1875

Pro Asp Asp Trp Val Glu Ile Glu Pro Lys Ala Phe Gly Leu Asn  
 1880 1885 1890

Phe Arg Asp Val Met Val Ala Met Gly Gln Leu Glu Ala Asn Arg  
 1895 1900 1905

Val Met Gly Phe Glu Cys Ala Gly Val Ile Thr Lys Leu Gly Gly  
 1910 1915 1920

Ala Ala Ala Ala Ser Gln Gly Leu Arg Leu Gly Asp Arg Val Cys  
 1925 1930 1935

Ala Leu Leu Lys Gly His Trp Ala Thr Arg Thr Gln Thr Pro Tyr  
 1940 1945 1950

Thr Asn Val Val Arg Ile Pro Asp Glu Met Gly Phe Pro Glu Ala  
 1955 1960 1965

Ala Ser Val Pro Leu Ala Phe Thr Thr Ala Tyr Ile Ala Leu Tyr  
 1970 1975 1980

Thr Thr Ala Lys Leu Arg Arg Gly Glu Arg Val Leu Ile His Ser  
 1985 1990 1995

Gly Ala Gly Gly Val Gly Gln Ala Ala Ile Ile Leu Ser Gln Leu  
 2000 2005 2010

Ala Gly Ala Glu Val Phe Val Thr Ala Gly Thr Gln Ala Lys Arg  
 2015 2020 2025

Asp Phe Val Gly Asp Lys Phe Gly Ile Asn Pro Asp His Ile Phe  
 2030 2035 2040

Ser Ser Arg Asn Asp Leu Phe Val Asp Gly Ile Lys Ala Tyr Thr  
 2045 2050 2055

Gly Gly Leu Gly Val His Val Val Leu Asn Ser Leu Ala Gly Gln  
 2060 2065 2070

Leu Leu Gln Ala Ser Phe Asp Cys Met Ala Glu Phe Gly Arg Phe  
 2075 2080 2085

Val Glu Ile Gly Lys Lys Asp Leu Glu Gln Asn Ser Arg Leu Asp  
 2090 2095 2100

Met Leu Pro Phe Thr Arg Asp Val Ser Phe Thr Ser Ile Asp Leu  
 2105 2110 2115

Leu Ser Trp Gln Arg Ala Lys Ser Glu Glu Val Ser Glu Ala Leu  
 2120 2125 2130

Asn His Val Thr Lys Leu Leu Glu Thr Lys Ala Ile Gly Leu Ile  
 2135 2140 2145

Gly Pro Ile Gln Gln His Ser Leu Ser Asn Ile Glu Lys Ala Phe  
 2150 2155 2160

Arg Thr Met Gln Ser Gly Gln His Val Gly Lys Val Val Val Asn  
 2165 2170 2175

Val Ser Gly Asp Glu Leu Val Pro Val Gly Asp Gly Gly Phe Ser  
 2180 2185 2190

Leu Lys Leu Lys Pro Asp Ser Ser Tyr Leu Val Ala Gly Gly Leu  
 2195 2200 2205

Gly Gly Ile Gly Lys Gln Ile Cys Gln Trp Leu Val Asp His Gly  
 2210 2215 2220

Ala Lys His Leu Ile Ile Leu Ser Arg Ser Ala Lys Ala Ser Pro  
 2225 2230 2235

Phe Ile Thr Ser Leu Gln Asn Gln Gln Cys Ala Val Tyr Leu His  
 2240 2245 2250

Ala Cys Asp Ile Ser Asp Gln Asp Gln Val Thr Lys Val Leu Arg  
 2255 2260 2265

Leu Cys Glu Glu Ala His Ala Pro Pro Ile Arg Gly Ile Ile Gln  
 2270 2275 2280

Gly Ala Met Val Leu Lys Asp Ala Leu Leu Ser Arg Met Thr Leu  
 2285 2290 2295

Asp Glu Phe Asn Ala Ala Thr Arg Pro Lys Val Gln Gly Ser Trp  
 2300 2305 2310

Tyr Leu His Lys Ile Ala Gln Asp Val Asp Phe Phe Val Met Leu  
 2315 2320 2325

Ser Ser Leu Val Gly Val Met Gly Gly Ala Gly Gln Ala Asn Tyr  
 2330 2335 2340

Ala Ala Ala Gly Ala Phe Gln Asp Ala Leu Ala His His Arg Arg  
 2345 2350 2355

Ala His Gly Met Pro Ala Val Thr Ile Asp Leu Gly Met Val Lys  
 2360 2365 2370

Ser Val Gly Tyr Val Ala Glu Thr Gly Arg Gly Val Ala Asp Arg  
 2375 2380 2385

Leu Ala Arg Ile Gly Tyr Lys Pro Met His Glu Lys Asp Val Met  
 2390 2395 2400

Asp Val Leu Glu Lys Ala Ile Leu Cys Ser Ser Pro Gln Phe Pro  
 2405 2410 2415

Ser Pro Pro Ala Ala Val Val Thr Gly Ile Asn Thr Ser Pro Gly  
 2420 2425 2430

Ala His Trp Thr Glu Ala Asn Trp Ile Gln Glu Gln Arg Phe Val  
 2435 2440 2445

Gly Leu Lys Tyr Arg Gln Val Leu His Ala Asp Gln Ser Phe Val  
 2450 2455 2460

Ser Ser His Lys Lys Gly Pro Asp Gly Val Arg Ala Gln Leu Ser  
 2465 2470 2475

Arg Val Thr Ser His Asp Glu Ala Ile Ser Ile Val Leu Lys Ala  
 2480 2485 2490

Met Thr Glu Lys Leu Met Arg Met Phe Gly Leu Ala Glu Asp Asp  
 2495 2500 2505

Met Ser Ser Ser Lys Asn Leu Ala Gly Val Gly Val Asp Ser Leu  
 2510 2515 2520

Val Ala Ile Glu Leu Arg Asn Trp Ile Thr Ser Glu Ile His Val  
 2525 2530 2535

Asp Val Ser Ile Phe Glu Leu Met Asn Gly Asn Thr Ile Ala Gly  
 2540 2545 2550

Leu Val Glu Leu Val Val Ala Lys Cys Ser  
 2555 2560

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 <212> DNA  
 <213> Penicillium citrinum

<220>  
 <221> CDS  
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<400> 47  
 atg ctc ggc cag gtt ctg acc gtc gaa tcg tac caa tgg gta tcg 48  
 Met Leu Gly Gln Val Leu Leu Thr Val Glu Ser Tyr Gln Trp Val Ser  
 1 5 10 15

acc cct caa gcc ctt gtg gcg gtc gca gtg ctt ctt agt ctc atc gcc 96  
 Thr Pro Gln Ala Leu Val Ala Val Leu Leu Ser Leu Ile Ala  
 20 25 30

tac cgt ttg cgg ggg cgc cag tcc gaa ctg caa gtc tat aat ccc aaa 144  
 Tyr Arg Leu Arg Gly Arg Gln Ser Glu Leu Gln Val Tyr Asn Pro Lys  
 35 40 45

aaa tgg tgg gag ttg acg acc atg agg gct agg cag gac ttc gat acg 192  
 Lys Trp Trp Glu Leu Thr Thr Met Arg Ala Arg Gln Asp Phe Asp Thr  
 50 55 60

tat ggt ccg agc tgg atc gaa gct tgg ttc tcg aaa aac gac aag ccc Tyr Gly Pro Ser Trp Ile Glu Ala Trp Phe Ser Lys Asn Asp Lys Pro 65 70 75 80	240
ctg cgc ttc att gtt gat tcc ggc tat tgc acc atc ctc cca tcg tcc Leu Arg Phe Ile Val Asp Ser Gly Tyr Cys Thr Ile Leu Pro Ser Ser 85 90 95	288
atg gcc gac gag ttt cgg aaa atc aaa gat atg tgc atg tac aag ttt Met Ala Asp Glu Phe Arg Lys Ile Lys Asp Met Cys Met Tyr Lys Phe 100 105 110	336
ttg gcg gat gac ttt cac tct cat ctc cct gga ttc gac ggg ttc aag Leu Ala Asp Asp Phe His Ser His Leu Pro Gly Phe Asp Gly Phe Lys 115 120 125	384
gaa atc tgc cag gat gca cat ctt gtc aac aaa gtt gtt ttg aac cag Glu Ile Cys Gln Asp Ala His Leu Val Asn Lys Val Val Leu Asn Gln 130 135 140	432
tta caa acc caa gcc ccc aag tac aca aag cca ttg gct acc ttg gcc Leu Gln Thr Gln Ala Pro Lys Tyr Thr Lys Pro Leu Ala Thr Leu Ala 145 150 155 160	480
gac gct act att gcc aag ttg ttc ggt aaa agc gag gag tgg caa acc Asp Ala Thr Ile Ala Lys Leu Phe Gly Lys Ser Glu Glu Trp Gln Thr 165 170 175	528
gca cct gtc tat tcc aat gga ttg gac ctt gtc aca cga aca gtc aca Ala Pro Val Tyr Ser Asn Gly Leu Asp Leu Val Thr Arg Thr Val Thr 180 185 190	576
ctc att atg gtc ggc gac aaa atc tgc cac aat gag gag tgg ctg gat Leu Ile Met Val Gly Asp Lys Ile Cys His Asn Glu Trp Leu Asp 195 200 205	624
att gca aag aac cat gcc gtg agt gtg gcg gta caa gct cgc caa ctt Ile Ala Lys Asn His Ala Val Ser Val Ala Val Gln Ala Arg Gln Leu 210 215 220	672
cgc gta tgg ccc atg cta ctg cga ccg ctc gct cac tgg ttt caa ccg Arg Val Trp Pro Met Leu Leu Arg Pro Leu Ala His Trp Phe Gln Pro 225 230 235 240	720
caa gga cgc aaa ttg cgt gac caa gtg cgc cgc gca cga aag atc att Gln Gly Arg Lys Leu Arg Asp Gln Val Arg Arg Ala Arg Lys Ile Ile 245 250 255	768
gat cct gag att cag cga cga cgt gct gaa aag gcc gca tgt gta gcg Asp Pro Glu Ile Gln Arg Arg Ala Glu Lys Ala Ala Cys Val Ala 260 265 270	816
aag ggc gtg cag ccg ccc cag tac gtc gat acc atg caa tgg ttt gaa Lys Gly Val Gln Pro Pro Gln Tyr Val Asp Thr Met Gln Trp Phe Glu 275 280 285	864
gac acc gcc gac ggc cgc tgg tac gat gtg gcg ggt gct cag ctc gct Asp Thr Ala Asp Gly Arg Trp Tyr Asp Val Ala Gly Ala Gln Leu Ala 290 295 300	912
atg gat ttc gcc ggc atc tac gcc tcg acg gat ctt ttc gtc ggt gcc Met Asp Phe Ala Gly Ile Tyr Ala Ser Thr Asp Leu Phe Val Gly Ala 305 310 315 320	960
ctt gtg gac att gcc agg cac cca gac ctt att cag cct ctc cgc caa Leu Val Asp Ile Ala Arg His Pro Asp Leu Ile Gln Pro Leu Arg Gln 325 330 335	1008
gag atc cgc act gta atc gga gaa ggg ggc tgg acg cct gcc tct ctg Glu Ile Arg Thr Val Ile Gly Glu Gly Trp Thr Pro Ala Ser Leu	1056

340

345

350

ttc aag ctg aag ctc ctc gac agc tgc atg aaa gag acg cag cga atc			1104
Phe Lys Leu Lys Leu Leu Asp Ser Cys Met Lys Glu Thr Gln Arg Ile			
355	360	365	
aag ccg gtc gag tgc gcc act atg cgc agt acc gct ctc aga gac atc			1152
Lys Pro Val Glu Cys Ala Thr Met Arg Ser Thr Ala Leu Arg Asp Ile			
370	375	380	
act cta tcc aat ggc ctc ttc att ccc aag ggc gag ttg gcc gct gtg			1200
Thr Leu Ser Asn Gly Leu Phe Ile Pro Lys Gly Glu Leu Ala Ala Val			
385	390	395	400
gct gca gac cgc atg aac aac cct gat gtg tgg gaa aac ccc gaa aat			1248
Ala Ala Asp Arg Met Asn Asn Pro Asp Val Trp Glu Asn Pro Glu Asn			
405	410	415	
tat gat ccc tac cga ttt atg cgc atg cgc gag gat cca gac aag gcc			1296
Tyr Asp Pro Tyr Arg Phe Met Arg Met Arg Glu Asp Pro Asp Lys Ala			
420	425	430	
ttc acc gct caa ttg gag aat acc aac ggt gat cac atc ggc ttc ggc			1344
Phe Thr Ala Gln Leu Glu Asn Thr Asn Gly Asp His Ile Gly Phe Gly			
435	440	445	
tgg aac cca cgc gct tgt ccc ggg cgg ttc ttc gcc tcg aag gaa atc			1392
Trp Asn Pro Arg Ala Cys Pro Gly Arg Phe Phe Ala Ser Lys Glu Ile			
450	455	460	
aag att ctc ctc gct cat ata ctg att cag tat gat gtg aag cct gta			1440
Lys Ile Leu Leu Ala His Ile Leu Ile Gln Tyr Asp Val Lys Pro Val			
465	470	475	480
cca gga gac gat gac aaa tac tac cgt cac gct ttt agc gtt cgt atg			1488
Pro Gly Asp Asp Lys Tyr Tyr Arg His Ala Phe Ser Val Arg Met			
485	490	495	
cat cca acc aca aag ctc atg gta cgc cgg cgc aac gag gac atc ccg			1536
His Pro Thr Thr Lys Leu Met Val Arg Arg Arg Asn Glu Asp Ile Pro			
500	505	510	
ctc cct cat gac cgg tgc taa			1557
Leu Pro His Asp Arg Cys			
515			

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 <211> 518  
 <212> PRT  
 <213> Penicillium citrinum

<400> 48

Met Leu Gly Gln Val Leu Leu Thr Val Glu Ser Tyr Gln Trp Val Ser  
 1 5 10 15

Thr Pro Gln Ala Leu Val Ala Val Leu Leu Ser Leu Ile Ala  
 20 25 30

Tyr Arg Leu Arg Gly Arg Gln Ser Glu Leu Gln Val Tyr Asn Pro Lys  
 35 40 45

Lys Trp Trp Glu Leu Thr Thr Met Arg Ala Arg Gln Asp Phe Asp Thr  
 50 55 60

Tyr Gly Pro Ser Trp Ile Glu Ala Trp Phe Ser Lys Asn Asp Lys Pro  
 65 70 75 80

Leu Arg Phe Ile Val Asp Ser Gly Tyr Cys Thr Ile Leu Pro Ser Ser  
 85 90 95

Met Ala Asp Glu Phe Arg Lys Ile Lys Asp Met Cys Met Tyr Lys Phe  
 100 105 110

Leu Ala Asp Asp Phe His Ser His Leu Pro Gly Phe Asp Gly Phe Lys  
 115 120 125

Glu Ile Cys Gln Asp Ala His Leu Val Asn Lys Val Val Leu Asn Gln  
 130 135 140

Leu Gln Thr Gln Ala Pro Lys Tyr Thr Lys Pro Leu Ala Thr Leu Ala  
 145 150 155 160

Asp Ala Thr Ile Ala Lys Leu Phe Gly Lys Ser Glu Glu Trp Gln Thr  
 165 170 175

Ala Pro Val Tyr Ser Asn Gly Leu Asp Leu Val Thr Arg Thr Val Thr  
 180 185 190

Leu Ile Met Val Gly Asp Lys Ile Cys His Asn Glu Glu Trp Leu Asp  
 195 200 205

Ile Ala Lys Asn His Ala Val Ser Val Ala Val Gln Ala Arg Gln Leu  
 210 215 220

Arg Val Trp Pro Met Leu Leu Arg Pro Leu Ala His Trp Phe Gln Pro  
 225 230 235 240

Gln Gly Arg Lys Leu Arg Asp Gln Val Arg Arg Ala Arg Lys Ile Ile  
 245 250 255

Asp Pro Glu Ile Gln Arg Arg Ala Glu Lys Ala Ala Cys Val Ala  
 260 265 270

Lys Gly Val Gln Pro Pro Gln Tyr Val Asp Thr Met Gln Trp Phe Glu  
 275 280 285

Asp Thr Ala Asp Gly Arg Trp Tyr Asp Val Ala Gly Ala Gln Leu Ala  
 290 295 300

Met Asp Phe Ala Gly Ile Tyr Ala Ser Thr Asp Leu Phe Val Gly Ala  
 305 310 315 320

Leu Val Asp Ile Ala Arg His Pro Asp Leu Ile Gln Pro Leu Arg Gln  
 325 330 335

Glu Ile Arg Thr Val Ile Gly Glu Gly Trp Thr Pro Ala Ser Leu  
 340 345 350

Phe Lys Leu Lys Leu Leu Asp Ser Cys Met Lys Glu Thr Gln Arg Ile  
 355 360 365

Lys Pro Val Glu Cys Ala Thr Met Arg Ser Thr Ala Leu Arg Asp Ile  
 370 375 380

Thr Leu Ser Asn Gly Leu Phe Ile Pro Lys Gly Glu Leu Ala Ala Val  
 385 390 395 400

Ala Ala Asp Arg Met Asn Asn Pro Asp Val Trp Glu Asn Pro Glu Asn  
 405 410 415

Tyr Asp Pro Tyr Arg Phe Met Arg Met Arg Glu Asp Pro Asp Lys Ala  
 420 425 430

Phe Thr Ala Gln Leu Glu Asn Thr Asn Gly Asp His Ile Gly Phe Gly  
 435 440 445

Trp Asn Pro Arg Ala Cys Pro Gly Arg Phe Phe Ala Ser Lys Glu Ile  
 450 455 460

Lys Ile Leu Leu Ala His Ile Leu Ile Gln Tyr Asp Val Lys Pro Val  
 465 470 475 480

Pro Gly Asp Asp Asp Lys Tyr Tyr Arg His Ala Phe Ser Val Arg Met  
 485 490 495

His Pro Thr Thr Lys Leu Met Val Arg Arg Arg Asn Glu Asp Ile Pro  
 500 505 510

Leu Pro His Asp Arg Cys  
 515

<210> 49  
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 <212> DNA  
 <213> Penicillium citrinum

<220>  
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<400> 49  
 atg gtc gct tcg ttg cta ccc tct cgc ttt cgc ggt agg gaa tca atg 48  
 Met Val Ala Ser Leu Leu Pro Ser Arg Phe Arg Gly Arg Glu Ser Met  
 1 5 10 15

aat cag cag cac cct cta cgc tcg gga aat cgg gca ttg acc tcc aca 96  
 Asn Gln Gln His Pro Leu Arg Ser Gly Asn Arg Ala Leu Thr Ser Thr  
 20 25 30

ctc caa ttt cta tcc aaa acg gcg tgt cta cac ccg atc cat acc gtt  
 Leu Gln Phe Leu Ser Lys Thr Ala Cys Leu His Pro Ile His Thr Val 144  
 35 40 45

tgc acc ata gct att cta gct agt acc aca tac gtt gga cta ctc aaa  
 Cys Thr Ile Ala Ile Leu Ala Ser Thr Thr Tyr Val Gly Leu Leu Lys 192

50

55

60

gac	agc	tcc	tcc	cat	ggc	ccc	gca	aac	gtt	gat	aaa	gca	gaa	tgg	ggc	240
Asp	Ser	Phe	Phe	His	Gly	Pro	Ala	Asn	Val	Asp	Lys	Ala	Glu	Trp	Gly	
65					70				75		80					
tct	ttg	gtc	gaa	gga	agt	cga	agc	ttg	atc	acc	ggc	cca	cag	aat	ggc	288
Ser	Leu	Val	Glu	Gly	Ser	Arg	Ser	Leu	Ile	Thr	Gly	Pro	Gln	Asn	Gly	
85					90				95							
tgg	aag	tgg	cag	agc	tcc	gac	ggg	gat	gca	gat	gtt	ctc	gga	gat	tcc	336
Trp	Lys	Trp	Gln	Ser	Phe	Asp	Gly	Asp	Ala	Asp	Val	Leu	Gly	Asp	Phe	
100					105				110							
aac	cat	caa	gca	cta	atg	acc	ttg	gta	ttc	ccg	ggg	tca	tat	ggg	gtt	384
Asn	His	Gln	Ala	Leu	Met	Thr	Leu	Val	Phe	Pro	Gly	Ser	Tyr	Gly	Val	
115					120				125							
gca	tct	caa	gca	gcc	tca	cca	tcc	ctt	gct	ccc	ctc	cct	gtg	aac	cta	432
Ala	Ser	Gln	Ala	Ala	Ser	Pro	Phe	Leu	Ala	Pro	Leu	Pro	Val	Asn	Leu	
130					135				140							
tct	gtg	att	gac	ctt	ccc	tca	acg	tcg	agg	cct	tta	acc	gcc	tat	tcg	480
Ser	Val	Ile	Asp	Leu	Pro	Ser	Thr	Ser	Ser	Pro	Leu	Thr	Ala	Tyr	Ser	
145					150				155				160			
aaa	gat	aaa	gtt	ttc	gcc	ttc	tct	gtg	gaa	tac	agc	agc	gct	ccg	gaa	528
Lys	Asp	Lys	Val	Phe	Ala	Phe	Ser	Val	Glu	Tyr	Ser	Ser	Ala	Pro	Glu	
165					170				175							
ctc	gtg	gct	gtt	caa	gaa	atc	ccc	aac	aac	agt	gcc	gac	ctg	aaa	576	
Leu	Val	Ala	Ala	Val	Gln	Glu	Ile	Pro	Asn	Asn	Ser	Ala	Asp	Leu	Lys	
180					185				190							
ttg	cag	gag	acg	caa	ttg	atc	gag	atg	gaa	cgc	cag	atg	tgg	atc	atg	624
Leu	Gln	Glu	Thr	Gln	Leu	Ile	Glu	Met	Glu	Arg	Gln	Met	Trp	Ile	Met	
195					200				205							
aag	gct	gcc	agg	gct	cac	aca	aaa	cgc	agc	ctt	gct	caa	tgg	gtg	cac	672
Lys	Ala	Ala	Arg	Ala	His	Thr	Lys	Arg	Ser	Leu	Ala	Gln	Trp	Val	His	
210					215				220							
gat	acc	tgg	aca	gag	tct	ctt	gat	ctt	atc	aag	agc	gct	caa	acg	ctc	720
Asp	Thr	Trp	Thr	Glu	Ser	Leu	Asp	Leu	Ile	Lys	Ser	Ala	Gln	Thr	Leu	
225					230				235			240				
gac	gtg	gtt	gtc	atg	gtg	cta	ggt	tat	ata	tca	atg	cac	ttg	act	ttc	768
Asp	Val	Val	Val	Met	Val	Leu	Gly	Tyr	Ile	Ser	Met	His	Leu	Thr	Phe	
245					250				255							
gtc	tca	ctc	ttc	ctc	agc	atg	aaa	aaa	ttg	gga	tcg	aag	gtt	tgg	ctg	816
Val	Ser	Leu	Phe	Leu	Ser	Met	Lys	Lys	Leu	Gly	Ser	Lys	Val	Trp	Leu	
260					265				270							
gct	aca	agc	gtc	ctt	ttg	tcg	tca	aca	ttt	gcc	ttt	ctc	ctc	ggt	ctc	864
Ala	Thr	Ser	Val	Leu	Leu	Ser	Ser	Thr	Phe	Ala	Phe	Leu	Leu	Gly	Leu	
275					280				285							
gac	gtg	gcc	ata	aga	cta	ggg	gtt	ccg	atg	agc	atg	agg	ttg	cta	tcc	912
Asp	Val	Ala	Ile	Arg	Leu	Gly	Val	Pro	Met	Ser	Met	Arg	Leu	Leu	Ser	
290					295				300							
gaa	ggc	ctc	ccc	ttc	ttg	gtg	gtg	atc	gtt	ggc	ttt	gag	aag	agc	atc	960
Glu	Gly	Leu	Pro	Phe	Leu	Val	Val	Ile	Val	Gly	Phe	Glu	Lys	Ser	Ile	
305					310				315			320				
act	ctg	acc	agg	gct	gtt	ttg	tcc	tat	gct	gtg	cag	cac	cga	aag	ccc	1008
Thr	Leu	Thr	Arg	Ala	Val	Leu	Ser	Tyr	Ala	Val	Gln	His	Arg	Lys	Pro	
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acc atc aat tac gcc gta cga agc gcc att cgg gag aag ggt tac aat Thr Ile Asn Tyr Ala Val Arg Ser Ala Ile Arg Glu Lys Gly Tyr Asn 355 360 365	1104
atc gtg tgc cac tac gtg gtc gag atc ctg ctc cta gtt atc ggt gct Ile Val Cys His Tyr Val Val Glu Ile Leu Leu Leu Val Ile Gly Ala 370 375 380	1152
gtc tta ggc atc caa ggt ggg cta cag cac ttc tgt gtt cta gct gca Val Leu Gly Ile Gln Gly Leu Gln His Phe Cys Val Leu Ala Ala 385 390 395 400	1200
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Asn Leu Pro Ser His Pro Val Asp Pro Val Glu Leu Asp Gln Ala Glu			
625 630 635 640			
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Ser Phe Asn Ala Ala Gln Asn Gln Thr Pro Gln Ile Gln Ser Ser Leu			
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Gln Ala Pro Gln Thr Arg Val Phe Thr Pro Thr Thr Asp Ser Asp			
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Val Leu Gly Ala Cys Cys Glu Asn Val Ile Gly Tyr Met Pro Val Pro			
785 790 795 800			
gtt ggc gtc gcc ggt cct att gtt atc gac ggc aag agt tat ttc att			2448
Val Gly Val Ala Gly Pro Ile Val Ile Asp Gly Lys Ser Tyr Phe Ile			
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cct atg gca acc acc gag ggc gtc ctc gtc gct agt gct agc cgt ggc			2496
Pro Met Ala Thr Thr Glu Gly Val Leu Val Ala Ser Ala Ser Arg Gly			
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Asp Gly Met Thr Arg Gly Pro Cys Val Lys Phe Asp Val Leu Glu Arg			
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Met Lys Glu Ala Phe Asn Ser Thr Ser Arg Phe Ala Arg Leu Gln Ser			
885 890 895			

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His	Ala	Leu	Asn	Val	Met	Ala	Thr	Glu	Ala	Gly	Phe	Ser	Asp	Met	Asn	
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att	att	acc	cta	tca	gga	aat	tac	tgt	acg	gat	aag	aaa	cct	tca	gct	2880
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Gly	Ser	Val	Gly	Gly	Phe	Asn	Ala	Gln	Ala	Ala	Asn	Leu	Ala	Ala		
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Gln	Ile	Ser	Val	Ser	Met	Pro	Ser	Ile	Glu	Val	Gly	Thr	Leu	Gly		
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Gly	Val	Arg	Gly	Ser	His	Pro	Thr	Thr	Pro	Gly	Glu	Asn	Ala	Arg		
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caa	ctt	gg	cc	atc	atc	gg	ag	g	ctt	ttt	g	gg	g	tc	3339	
Gln	Leu	Ala	Arg	Ile	Ile	Gly	Ser	Ala	Val	Leu	Ala	Gly	Glu	Leu		
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tcg	cta	tgt	gtc	cta	gg	cc	gg	cac	ctg	gtc	aag	gg	cc	cac	3384	
Ser	Leu	Cys	Ala	Ala	Leu	Ala	Ala	Gly	His	Leu	Val	Lys	Ala	His		
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Ser	Val	Ser	Pro	Ser	Gly	Gly	Thr	Arg	Thr	Val	Pro	Val	Pro	Asn		
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Cys Thr Ile Ala Ile Leu Ala Ser Thr Thr Tyr Val Gly Leu Leu Lys  
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Asp Ser Phe Phe His Gly Pro Ala Asn Val Asp Lys Ala Glu Trp Gly  
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Trp Lys Trp Gln Ser Phe Asp Gly Asp Ala Asp Val Leu Gly Asp Phe  
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Asn His Gln Ala Leu Met Thr Leu Val Phe Pro Gly Ser Tyr Gly Val  
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Ala Ser Gln Ala Ala Ser Pro Phe Leu Ala Pro Leu Pro Val Asn Leu  
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Ser Val Ile Asp Leu Pro Ser Thr Ser Ser Pro Leu Thr Ala Tyr Ser  
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Lys Asp Lys Val Phe Ala Phe Ser Val Glu Tyr Ser Ser Ala Pro Glu  
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Leu Val Ala Ala Val Gln Glu Ile Pro Asn Asn Ser Ala Asp Leu Lys  
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Leu Gln Glu Thr Gln Leu Ile Glu Met Glu Arg Gln Met Trp Ile Met  
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Lys Ala Ala Arg Ala His Thr Lys Arg Ser Leu Ala Gln Trp Val His  
 210 215 220

Asp Thr Trp Thr Glu Ser Leu Asp Leu Ile Lys Ser Ala Gln Thr Leu  
 225 230 235 240

Asp Val Val Val Met Val Leu Gly Tyr Ile Ser Met His Leu Thr Phe  
245 250 255

Val Ser Leu Phe Leu Ser Met Lys Lys Leu Gly Ser Lys Val Trp Leu  
260 265 270

Ala Thr Ser Val Leu Leu Ser Ser Thr Phe Ala Phe Leu Leu Gly Leu  
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Asp Val Ala Ile Arg Leu Gly Val Pro Met Ser Met Arg Leu Leu Ser  
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Glu Gly Leu Pro Phe Leu Val Val Ile Val Gly Phe Glu Lys Ser Ile  
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Thr Leu Thr Arg Ala Val Leu Ser Tyr Ala Val Gln His Arg Lys Pro  
325 330 335

Gln Lys Ile Gln Ser Asp Gln Gly Ser Val Thr Ala Ile Ala Glu Ser  
340 345 350

Thr Ile Asn Tyr Ala Val Arg Ser Ala Ile Arg Glu Lys Gly Tyr Asn  
355 360 365

Ile Val Cys His Tyr Val Val Glu Ile Leu Leu Leu Val Ile Gly Ala  
370 375 380

Val Leu Gly Ile Gln Gly Gly Leu Gln His Phe Cys Val Leu Ala Ala  
385 390 395 400

Leu Ile Leu Phe Phe Asp Cys Leu Leu Leu Phe Thr Phe Tyr Thr Ala  
405 410 415

Ile Leu Ser Ile Lys Leu Glu Val Asn Arg Leu Lys Arg His Ile Asn  
420 425 430

Met Arg Tyr Ala Leu Glu Asp Glu Gly Leu Ser Gln Arg Thr Ala Glu  
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Ser Val Ala Thr Ser Asn Asp Ala Gln Asp Ser Ala Arg Thr Tyr Leu  
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Phe Gly Asn Asp Met Lys Gly Ser Ser Val Pro Lys Phe Lys Phe Trp  
465 470 475 480

Met Val Val Gly Phe Leu Ile Val Asn Leu Val Asn Ile Gly Ser Thr  
485 490 495

Leu Phe Gln Ala Ser Ser Ser Gly Ser Leu Ser Ser Ile Ser Ser Trp  
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Thr Glu Ser Leu Ser Gly Ser Ala Ile Lys Pro Pro Leu Glu Pro Phe  
 515 520 525

Lys Val Ala Gly Ser Gly Leu Asp Glu Leu Leu Phe Gln Ala Arg Gly  
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Arg Gly Gln Ser Thr Met Val Thr Val Leu Ala Pro Ile Lys Tyr Glu  
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Leu Glu Tyr Pro Ser Ile His Arg Gly Thr Ser Gln Leu His Glu Tyr  
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Gly Val Gly Gly Lys Met Val Gly Ser Leu Leu Thr Ser Leu Glu Asp  
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Pro Val Leu Ser Lys Trp Val Phe Val Ala Leu Ala Leu Ser Val Ala  
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Leu Asn Ser Tyr Leu Phe Lys Ala Ala Arg Leu Gly Ile Lys Asp Pro  
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Asn Leu Pro Ser His Pro Val Asp Pro Val Glu Leu Asp Gln Ala Glu  
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Ser Phe Asn Ala Ala Gln Asn Gln Thr Pro Gln Ile Gln Ser Ser Leu  
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Gln Ala Pro Gln Thr Arg Val Phe Thr Pro Thr Thr Asp Ser Asp  
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Ser Asp Ala Ser Leu Val Leu Ile Lys Ala Ser Leu Lys Val Thr Lys  
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Arg Ala Glu Gly Lys Thr Ala Thr Ser Glu Leu Pro Val Ser Arg Thr  
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Gln Ile Glu Leu Asp Asn Leu Leu Lys Gln Asn Thr Ile Ser Glu Leu  
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Asn Asp Glu Asp Val Val Ala Leu Ser Leu Arg Gly Lys Val Pro Gly  
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Tyr Ala Leu Glu Lys Ser Leu Lys Asp Cys Thr Arg Ala Val Lys Val  
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Arg Arg Ser Ile Ile Ser Arg Thr Pro Ala Thr Ala Glu Leu Thr Ser  
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Met Leu Glu His Ser Lys Leu Pro Tyr Glu Asn Tyr Ala Trp Glu Arg  
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Val Leu Gly Ala Cys Cys Glu Asn Val Ile Gly Tyr Met Pro Val Pro  
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Val Gly Val Ala Gly Pro Ile Val Ile Asp Gly Lys Ser Tyr Phe Ile  
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Pro Met Ala Thr Thr Glu Gly Val Leu Val Ala Ser Ala Ser Arg Gly  
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Ser Lys Ala Ile Asn Leu Gly Gly Ala Val Thr Val Leu Thr Gly  
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Asp Gly Met Thr Arg Gly Pro Cys Val Lys Phe Asp Val Leu Glu Arg  
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Ala Gly Ala Ala Lys Ile Trp Leu Asp Ser Asp Val Gly Gln Thr Val  
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Met Lys Glu Ala Phe Asn Ser Thr Ser Arg Phe Ala Arg Leu Gln Ser  
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Thr Thr Gly Asp Ala Met Gly Met Asn Met Ile Ser Lys Gly Val Glu  
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